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REVIEW OF THE SUBCOMMITTEE'S REPORT ON PESTICIDES AND TO CONSIDER THE REGULATION OF EBDC (FUNGICIDE)

HEARING

BEFORE THE

SUBCOMMITTEE ON
TOXIC SUBSTANCES, ENVIRONMENTAL
OVERSIGHT, RESEARCH AND DEVELOPMENT

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

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CONTENTS

OPENING STATEMENTS

Page

Lieberman, Hon. Joseph I., U.S. Senator from the State of Connecticut 5
Reid, Hon. Harry, U.S. Senator from the State of Nevada 1
Warner, Hon. John W., U.S. Senator from the Commonwealth of Virginia 3

WITNESSES

Benbrook, Charles M., Director, Board on Agriculture 36
    Written statement 85
Fisher, Linda, Assistant Administrator, Pesticides and Toxic Substances, Environmental Protection Agency 19
    Written statement 66
Goodman, Robert M., National Research Council 35
    Written statement 85
Hightower, Hon. Jim, commissioner of agriculture, State of Texas 7
    Written statement 55

REVIEW OF THE SUBCOMMITTEE'S REPORT ON PESTICIDES AND TO CONSIDER THE REGULATION OF EBDC (FUNGICIDE)

FRIDAY, SEPTEMBER 22, 1989

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITEE ON TOXIC SUBSTANCES, ENVIRONMENTAL OVERSIGHT, RESEARCH AND DEVELOPMENT,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:06 a.m., in room 406, Dirksen Senate Office Building, Hon. Harry Reid (chairman of the subcommittee) presiding.

Present: Senators Reid, Lieberman, and Warner.

OPENING STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

Senator REID. Good morning, everyone.

The Subcommittee on Toxic Substances, Environmental Oversight, Research and Development is meeting today principally to review the subcommittee's report entitled Government Regulation of Pesticides in Food; the need for administrative and regulatory reform.

We also plan to discuss recent developments regarding the use of EBDCs, fungicides, found to cause tumors in laboratory animals, and a study released by the Board on Agriculture of the National Academy of Sciences entitled Alternative Agriculture.

On May 15, this subcommittee held a hearing to review the regulatory framework that was in place to address the safe use of chemicals on foods. Considerable attention focused on the reported health risks posed by Alar, and its continued use as a growth regulator on apples.

Despite repeated assurances by the government, industry and scientific societies as to the safety of Alar, there was a dramatic decrease in the purchase of apples and apple products.

The apple industry suffered considerable losses, losses which may have been avoided had a more responsive regulatory system been in place.

The comprehensive report provides a brief history about the regulation of pesticides in food, touching upon the paradoxes created by existing laws.

To a greater degree, the report reviews the history of the regulation of Alar, emphasizing the deficiencies in existing regulations which ultimately led to the removal of Alar from the domestic market in early June. Attention is also drawn to the role of the scientific advisory panel, and possible conflicts of interest issues affecting the members.

The Alar story also raised other questions about potential health effects of long-term dietary exposure to these chemicals. For example, is sufficient emphasis placed on the health of infants and children and other sensitive populations in EPA's regulatory process? Are appropriate tests conducted to determine what the neurotoxic effects of these pesticides may be? Are there any health risks to be considered when these chemicals are combined?

In conclusion, the subcommittee sets forth recommendations for reform of EPA's pesticide program, with the goals of safeguarding the food American consumers purchase at the supermarket, and protecting the environment and welfare of the American farmer.

Mrs. Linda Fisher of EPA's pesticides program will provide the agency's comments about the report and recommendations. With the Alar controversy still fresh in our minds, we will also ask EPA to discuss the status of its review of EBDC's.

EBDC's are fungicides used to control diseases in about 100 crops, widely used in apples, potatoes, tomatoes, wheat, sweet corn, onions and grapes. The risks from the use of EBDC's have been calculated to be among the highest ever associated with the use of a pesticide.

Earlier this month, the major manufacturers of EBDCs, DuPont, Rohm, Haas, and Pennwalt, announced a plan to voluntarily ban the use of EBDCs on certain crops. This is the first time a registrant has voluntarily removed a substance from the market when questions have been raised about the product's safety. Usually the company chooses to go through the agency's lengthy and cumbersome cancellation process.

We have asked the companies to present testimony about the unprecedented voluntary ban, but they declined to attend for a number of reasons.

A follow-up hearing on the industry's position will likely be in order.

According to EPA, approximately 1.2 billion pounds of pesticides costing $65 billion are sold each year. That is almost five pounds of pesticides for every man, woman and child in our country.

Some 70 percent of all pesticides in this country are applied in agricultural production. Agricultural chemical exports have also increased dramatically in the last 10 years.

Consumers are very concerned about the alphabet soup of chemicals in food. Publicity has focused on a program adopted by major supermarket chains in the United States to reduce the levels of toxic pesticides on fruits and vegetables.

Without question, agriculture plays a vital role in our society and our Nation's economy. Agricultural productivity has been a major contributing factor establishing the United States as a world economic force.

But crop losses from insects have nearly doubled since World War II, even with the increasing use of agricultural pesticides. Alternative agriculture, a study issued by the Board of Agriculture of the National Academy of Sciences, reviews the dimensions and structure of U.S. agriculture, its problems, and some of the alternatives available to farmers to resolve them.

After the release of this study, the headline in the New York Times was, "Science Academy says Chemicals Do Not Necessarily Increase Crops. Policy Shift on Aid Urged to Discourage Pesticides."

Mr. Robert Goodman of the committee on the role of alternative farming methods in modern production agriculture, accompanied by Dr. Charles Benbrook, executive director of the Board on Agriculture, is here today to discuss the Board's findings and talk about a key study focusing on integrated pest management in the production of fresh market vegetables in Florida.

The Hon. Jim Hightower, commissioner of agriculture for the State of Texas will discuss agriculture programs in Texas to help farmers practice alternative methods, relying on fewer chemicals.

We look forward to the comments of all witnesses.

I would say, prior to turning time over to the ranking member, Senator Warner, that we have a report by the subcommittee which was turned over to the chairman this morning, and it is to be accompanied by additional views of members of this subcommittee, Senators Warner and Jeffords.

Senator Warner.

OPENING STATEMENT OF HON. JOHN W. WARNER, U.S. SENATOR FROM THE COMMONWEALTH OF VIRGINIA

Senator **Warner.** Thank you, Mr. Chairman.

Mr. Chairman, I wish to compliment you and other members of this subcommittee for the work that we have done thus far, and I fully intend to continue to participate actively. I think by and large, our efforts have been bipartisan, and we have prepared this report, which, as you have stated, I have joined in.

Nevertheless, there are certain portions of the majority report which I felt required a different perspective, and I have provided that, together with Senator Jeffords, in the attachments to which you have referred.

As we look at this problem, and if you look at the existing statutory and regulatory material, I think we have to, in fairness, indicate that EPA and other Government agencies and departments have done their best to work within the framework of laws provided by the Congress, and if there is fault, some of that fault should be shared with the Congress in the manner in which we devised these laws.

I look forward to joining with you in working on FIFRA, and other statutes, to see what we can do to improve the situation.

I will ask that my statement be included in the record, so that we can expedite the hearings this morning.

I extend my apology to you, Mr. Chairman, and the witnesses. I am a conferee on the Defense Conference that meets at 10, and a conferee on the drug conference which meets at 10:15, so I have to be in three places at one time.

We anticipate the hurricane, so we are going to do all the congressional work in the next hour and a half.

Senator **Reid.** Senator Warner, I appreciate your being here.

You have been really bipartisan in everything that we have done here, which has made our work much easier.

You have stated to me personally that we both recognize the importance of the work in which we are engaged, and without bipartisan efforts, it will be that much more difficult, and neither of us will allow that to happen, Senator.

Senator **Warner**. Mr. Chairman, there is a famous saying.

We talk about the food chain, the importance of it. We are what we eat. And since you and I eat the same food, basically, we have got to be bipartisan.

[Senator Warner's statement follows:]

OPENING STATEMENT OF HON. JOHN W. WARNER, U.S. SENATOR FROM THE COMMONWEALTH OF VIRGINIA

The Senate Environment and Public Works Subcommittee on Toxic Substances, Environmental Oversight and Research and Development has spent a considerable amount of time this year reviewing the Environmental Protection Agency's (EPA) pesticide regulatory program. Perhaps the most significant force behind our efforts was the controversy which surfaced in February concerning daminozide (Alar). The Subcommittee has now issued its findings in the form of a report, and I must confess that my feelings with regard to this report are mixed. Consequently, while I signed the report, I, along with my colleague Senator Jeffords, have submitted additional views.

I signed the Subcommittee report because I believe that the Congress has a responsibility to further review and ultimately revise the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). In addition, I believe it is imperative that the American consumer have confidence not only in the safety of our food supply, but also in the Government's ability to effectively implement its pesticide regulatory program. I believe we can achieve this goal by revising FIFRA in a constructive fashion that will strengthen the EPA's ability to effectively implement the pesticide regulatory program. The Subcommittee report recognizes these points.

I find it somewhat disturbing, however, that the Subcommittee report focuses so much criticism on EPA's handling of the Alar controversy. I believe that EPA was as much a victim of the existing FIFRA statute as were the consumer and the Nation's fruit growers. In fact, the EPA worked very closely with me and other members of the Subcommittee in crafting the legislation, S. 1061, which ultimately led to the agreement reached between EPA and the Uniroyal Chemical Company whereby Uniroyal voluntarily halted sales of Alar.

In addition, at the request of myself and Senators Reid and Lieberman, the EPA recently took action to reduce the tolerance level for daminozide residues to zero. This action will give the American consumer confidence that this chemical will not continue to reside in food products imported into this country. The EPA is to be commended for this action.

As I stated during the Subcommittee hearings on May 15, 1989, much of the fault for the Alar controversy rests on Congress for past actions. We have a law in place that does not meet modern standards. It is the business of this Subcommittee to identify the problems in FIFRA and to help provide the solutions.

I am confident that with the help of the Administration, the United States Department of Agriculture (USDA), the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and members of industry we will be able to make the necessary revisions to FIFRA to avoid such a serious situation in the future. In fact, I anticipate the Administration will soon forward to Congress a comprehensive food safety proposal which will include amendments to FIFRA and the Federal Food, Drug and Cosmetic Act (FFDCA).

The cooperation and bipartisanship demonstrated during the Alar controversy will be an essential ingredient to the success of the work that lies ahead for the Subcommittee and the Administration.

With respect to the conclusions and recommendations contained in the Subcommittee report, I have mixed feelings here as well. I have outlined point by point the portions of the report with which I agree and disagree in my additional views which are attached to the Subcommittee report. I am pleased that Senator Jeffords has joined me in submitting these additional views.

I am anxious for the Congress to confront these and other issues concerning a safe food supply. The time has come for Congress to meet the challenge of revising

FIFRA and to develop with the Administration an effective food safety program. While some may differ in their approach to achieving this important goal, I am confident that all will participate in good faith and we will be successful.

The Alar controversy was in many respects unique. It is my hope that such a situation shall never recur. It is unfortunate that a problem of such magnitude and impact had to occur before the defects in the FIFRA statute could be identified.

Senator REID. Senator Lieberman.

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator LIEBERMAN. Thank you, Mr. Chairman, Senator Warner.

I agree and support the leadership of both of you in this committee, and I think Senator Warner has just said something that is right on point.

The work of this committee is on the cutting edge of probably the most broad-based consumer concern in America today, and it knows no partisan lines, obviously.

The party that you register with, or the ideology that you hold, does not affect the level of your concern about the safety of what you eat, and that is why I have been so pleased here in my first year to participate with the two of you, and work under your leadership in this important cause.

I am very proud of the subcommittee report. I think it is a real step forward. I would say that its conclusions are best summarized, if I may quote from the words of a Wisconsin apple grower, who said, "We wish we had a strong, believable and honest environmental protection agency that would make good rules, and we would abide by them."

I do not question the honesty of the EPA or the dedication of its staff. But looking at the record, I must join this apple grower and consumers and growers around the country in calling on the EPA to do more to assess the danger of pesticides and to protect the public from those that can cause us harm.

I hope EPA will do more to provide consumers and growers with the most accurate information possible about pesticide safety, and continues its review of the many chemicals that find their way onto our food.

The report that we issued today raises very serious concerns about the progress of pesticide regulation at the Environmental Protection Agency.

I am concerned about the glacial pace at which the re-registration program has proceeded. I am particularly disturbed by the time that it has taken EPA to remove chemicals from the market after the data shows them to be potential cancer or other health risks.

Obviously we are all familiar with the Alar story, but that story and the story of pesticide regulation in this country does not end with the voluntary withdrawal of Alar from the marketplace. Take the case of EBDC, which Senator Reid has referred to, a fungicide believed by many experts to be more dangerous than Alar.

Since 1971, staff scientists in EPA and the FDA first recommended that EBDC be banned based on carcinogenicity findings. For six years, there was no action at all. Then, in 1977, EPA initiated a special review of the fungicide.

Five years later, that special review was terminated. Five years after that, EPA began yet another special review. Two years later, it is now 1989, and no action from EPA.

Manufacturers have taken voluntary action earlier this month to suspend the use of EBDCs on a large number of fruits and vegetables, but after 18 long years of consideration by EPA, there is no final action.

Ironically, it was the manufacturers who took that step. I understand that they may have taken it in anticipation of EPA action, but this story highlights the slowness of our Government's response to studies that demonstrate a health concern.

Of course, the EBDC problem does not end with the recent action by the manufacturers. Despite their withdrawal of EBDC's from use on several fruits and vegetables, they still intend to manufacture it for use on other vegetables, such as tomatoes and potatoes.

That presents some difficult regulatory problems, because how can we prevent growers from buying EBDC? That is still going to be on their suppliers' shelves—and using it wherever they choose to use it? Obviously it will not be legal on some crops, but it is very difficult to police.

We know that FDA testing, for instance, is woefully inadequate.

The other, more fundamental, problem is that even if EBDC use could be restricted to tomatoes, from all we know, the public would still face a substantial cancer threat. Children in particular are at risk. They eat lots of tomatoes, both fresh and in the processed form, particularly when they eat pizza, spaghetti, or use ketchup. If my kids are any indication of the National sample, they eat a lot of pizza, spaghetti, and use a lot of ketchup.

The Natural Resources Defense Council says that over 50 percent of a child's risk from the EBDC metabolite, which is known as ETU, actually comes from processed tomatoes—so that so long as EBDC remains on tomatoes, and therefore on processed tomatoes, 50 percent of the risk of cancer to children is still out there.

In light of the Alar story and these facts about EBDC, the report I think recommends some very important steps that EPA should take.

One, review the most risky pesticides in a shortened time, and get dangerous ones off the market.

Second, adopt a new conflict of interest regulation for scientific advisory panel members and expand that panel's membership to include public health professionals and others with a stake in the health and safety of our families.

When you have got seven out of eight members of the panel making judgments about chemicals at the same time they receive income from the chemical industry, as was the case in Alar, it obviously does not do much to create public confidence in the decisions of that panel.

Third, EPA must use existing law, or seek changes in the law, to allow it to get dangerous chemicals off of our food more quickly.

Fourth, the agency must take into account the effect of pesticides on children and other sensitive groups in our population when it reviews the impact of pesticides on our health.

Fifth, EPA must begin to study the potential neurotoxic effects of pesticides, which is to say the effects which these pesticides in our food have on our brains. It must determine whether these chemicals in our diets are affecting our memories, our ability to function, and our ability to learn.

Changing the way EPA examines pesticides is, I understand, a massive undertaking, and I hope and I believe that the agency under the new leadership of Bill Reilly and Linda Fisher is prepared to make those changes.

I think we can agree—all of us—that the current system is not working as we would want it to work, and I hope from this hearing today we can set off together on a path that will fix the system so it does work to our satisfaction and in the interest of public safety.

Thank you, Mr. Chairman.

Senator REID. Thank you, Senator Lieberman, for your statement, and your diligence in working on this subcommittee.

You have attended all the meetings, helped chair the meetings, and have been heavily involved in setting the list of witnesses and being involved at all levels of the process, for which I am very grateful.

Senator LIEBERMAN. Thank you.

Senator REID. The first witness today will be the Hon. Jim Hightower, the Commissioner of Agriculture from the State of Texas.

STATEMENT OF HON. JIM HIGHTOWER, COMMISSIONER OF AGRICULTURE, STATE OF TEXAS

Mr. HIGHTOWER. Thank you.

Chairman Reid, I understand, being from your part of the country, it is difficult to sort out those Southern States, that both Texas and Florida do dip down into the Gulf of Mexico.

For your future reference, Texas is the one that has sweeter oranges and better looking elected officials.

That will help you, I think, to distinguish between the two.

Senator REID. Which one are you?

Mr. HIGHTOWER. I knew it would throw you off.

I am grateful for this opportunity to testify before this committee today, and I intend to testify in the old-time religious sense—full of enthusiastic tub-thumping support for the report of the National Academy of Sciences.

I do have a very weighty formal testimony here which is, I can assure you, every bit as scintillating as it is profound, but I will not tax your patience by reading that to you today. I merely submit it.

Senator REID. I have read it, and it is excellent. We will make that part of the record.

Mr. HIGHTOWER. Thank you.

I want to talk based on our experience in Texas about the findings of this report and what we think the significance of this report is. Coming in conjunction with the effort of this committee to review the work of the EPA and the effort of the Senate Agriculture Committee to re-write the Farm Bill in 1990, it really gives us an opportunity and an impetus to offer a new profitable and what we see as a sustainable beginning for American agriculture.

The report of the National Academy of Science really restores the old proven notion that agriculture is the art and science of cooperating with Nature, rather than trying to overwhelm Nature.

This report confirms in scientific detail our human experience, our agricultural experience, in the State of Texas.

To begin with, obviously the market is there—a very rapidly expanding market, as best we can determine from the data and the fastest expanding segment of the food market—for chemically free or low chemical food products.

This is no longer a matter of products to be picked up at the health-food store, by the tofu and incense crowd. Rather, it has become mainstream in the markets all across this country.

Texas, known well for its chili sauces and beef, increasingly wants a chili sauce and a beef that has no chemical contaminants in it.

We now have a concern about this, not only in our health food stores and our upscale sort of yuppie retail markets, but in our major supermarket chains. The HEB chain, in our State, has 52 stores with organic produce sections in them now. Sunharvest and Kroger stores in the Houston district, and Apple Tree, which was Safeway premerger, now has organic food products in its produce bins.

We are estimating that there is a national market of about a $4 billion a year in organic production right now. My own sense is that this year's survey is going to show that the market is much, much higher. I can tell you from personal experience, working with organic farmers, that we do not begin to have the supply to meet the demand.

If we quintupled the supply, or increased it by a power of ten, we still would not have the supply to meet the demand for this food.

You are familiar with the Harris poll taken in February of this year, which found that pesticide contamination was the number one concern of the American food shopper—in fact, 75 percent of those shoppers rated it as their top consumer concern, period.

Well, you may think that data is from New York, and Berkeley, California, or some place like that—but in Texas, a poll was taken in July of this year (the Texas poll, taken by Texas A&M) finding that, in fact, the concern in Texas is even greater. Some 87 percent of Texans, according to this poll, consider pesticides a health risk. Another 64 percent of the people told the pollsters doing this survey that they would pay more for organic produce if it were available.

The chemical lobby in our State responded by saying, "Well, that poll has an urban bias." They suggested that out in the rural areas where there is a better understanding—that was the way they put it—of agricultural chemicals, out there people would be less concerned about them.

In fact, the poll did address rural areas as well as urban, and 87 percent of rural residents found pesticides to be a health risk as well.

We have all sorts of surveys showing that not only are consumers concerned about this, but farmers are also aware of it.

An Iowa survey earlier this year found that protecting ground water from chemical contamination was the number one concern of farmers in that State. A survey by Iowa State University this spring found that 78 percent of Iowa farmers believed that modern farming is too chemically intensive.

A survey done by Abbott Laboratories, itself a chemical producer, found in a poll of 1,000 farmers across the country that nearly half of them said that their concern about using pesticides has increased over the past three years, while only four percent found that their concerns had decreased.

More than 40 percent of those farmers said that family members had expressed concern about the pesticides that they were using on their own farms. A third of those farmers said that even properly handled insecticides always or sometimes posed a health risk to the person handling them.

The farmers themselves are out there having to put this stuff on the land, exposing them and their families to these chemicals, and they are worried about it. In fact, Abbott Labs, whom I think we can assume has no anti-pesticide bias, reports that this survey demonstrated that concerns about pesticides are an issue on the farm, not just the concern of consumers or environmental groups.

A large number of the farmers surveyed are truly concerned about human and environmental safety, and they are discussing these issues with their families—and that is exactly what we find going on around the kitchen table of farm houses all across our State.

The spokesman for Abbott Labs concludes that it is clear that farmers need to be made aware of biological methods as environmentally compatible alternatives to ag chemicals. Certainly products that offer reduced risk will be more appealing to farmers as their concern about the risk continues to increase, just as it has over the past three years.

We have tried to offer some direction for farmers, some transition for farmers wanting to make the shift away from chemically intensive agriculture. We have established a program in our State for organic foods certification—a program that not only provides a certified process and a logo for the farmers to put on the produce, and the livestock, that they come up with, but also that involves on-farm inspection. Our inspectors go directly on each participating farm and certify that that farm is free of chemical pesticide use, and that no synthetic fertilizers have been applied to it.

We then make unannounced inspections every year following that. The market demands that. It is no good just to have a logo that you can put on produce, if there is no third party—in this case, Government—certifying that in fact what the market is getting is what the logo says it is. So wholesalers and retailers as well as ultimate consumers want this sort of direct assurance.

I can tell you as an elected official that I have never done anything as popular in my life as to have proposed this organic certification process in the State. It is very rare, in politics, as you know, that somebody would actually stop you on the street and thank you for having done something, but this has been my experience. I wish I had discovered it earlier. It would have made my re-election much happier.

The farmers themselves have responded dramatically. We expected we would have 20 to 50 farmers apply in the first couple of years and be certified. We already have certified about 100 farmers this year for organic production, and we expect to have 250 by next year. Altogether we have had about 600 inquiries from Texas producers.

These are not just people trying to go back to the farm, or a back-to-the-earth type of movement. It is not a matter of somebody out there with a half an acre, or even ten acres, saying "Hey, let's give this a run," although those sorts of people are involved, and we are moving people back on the farm, and increasing the number of farmers as a result of this program.

But increasingly, this mainstream farmers are involved—people who will diversify part of their acreage to put into organic production, or people who are converting their entire operations. Down around the Beaumont area, we have a farmer producing organic rice and crawfish on 167 acres—a pretty substantial operation for those commodities down there—and selling most of that rice to out of State suppliers, and the crawfish directly into restaurants in nearby Houston.

A producer near San Antonio has a 1,600 acre operation producing organic beef, and he is also the State's largest single producer of organic onions and carrots.

We have around the Dallas area, an organic peach and tomato producer who has become so successful at it that he is now cited as a model by the Texas A&M Extension Service, taking other farmers out who want to see how to do this.

My point is that this approach works, and it works in a way that is healthy for agriculture. A man named Burke Slaughter, out in the Texas Panhandle, almost became a statistic in 1982. His farm was going down, and I am talking about a pretty substantial operation out there, raising wheat and cotton—on probably a two-section farm, a two square mile operation.

He began to ask around if there was not a different way to be doing his business. We worked with him, some of the other agricultural institutions in our State worked with him, and he began to try some different practices—rotating that wheat and cotton crop, planting wheat in the cotton stubble one year, and cotton on the wheat stubble the next year. The third year, he would leave the land fallow.

As a result of these and other tillage practices, he shifted to a more sustainable form of agriculture, with less chemical use. Slaughter increased his profits by 50 percent, and today he is a 51 year old farmer still farming that land that he was going to lose about six years ago.

The point is that rotating crops for example, is nothing very radical. This is not a major shift. This is nothing new. We do not need a new science to discover this.

In fact, this is very old technology, coming back to modern usage. The Texas Agriculture Commissioner, in his 1908 report, said that there is absolutely no hope for the southern farmer so long as he depends utterly on dosing his starving land, year after year, with commercial fertilizers, instead of building it up by stock raising and proper crop rotation.

That was wise in 1908, and we have found some 80 years later that it is still wise. We need to try to extend this.

I will offer you one more example that gives you the sense of how this involves mainstream agriculture. I want to emphasize again, these are not balloon-flying hippies who are out there on the farm.

Joe and Peggy Maddox are farmers out around Colorado City, in the western part of our State—they own a 22,000 acre ranch, a pretty substantial enterprise.

They also had a $3 million debt as of 1985. They were going to leave the ranch. They sent their son Dalton off to Texas A&M, but not to study agriculture—to find a new line of work so that he could get off the farm.

Then, in 1985, they went to a sustainable agriculture conference that our department cosponsored with a number of other organizations, a holistic resources management conference.

Joe Maddox said that he saw the light. He is 48 years old, burly, a no-moustache, no-beard, no-nonsense sort of farmer, but he saw the light, and he converted his 22,000 acre ranch. He stopped using the expensive chemicals to kill the mesquite, to spray the weeds.

He began to use dogs to herd the cattle and use burros to protect the sheep from predators. He rotated his herds from pasture to pasture, which in the process broke up the dirt, meaning that it could absorb more of the very scarce moisture that is out there.

The result of all that is that he increased his production with less cost. His debt of $3 million is now down to $400,000. His son Dalton graduated from Texas A&M with a degree in agricultural economics, and has moved back to the farm, to take it over.

My point is, it works. It works in the fundamental sense, that people put dollars in their pockets, and they are able to keep their farms and be productive members of their communities, and to sustain those communities.

We need more of that, and there is a role for Government in helping to produce that. One of government's roles is to get out of the way, in some cases.

The Federal commodity programs themselves sometimes offer barriers to sustainable agriculture. We are working with Senator Leahy, Senator Fowler and others who are doing very innovative work on the 1990 Farm Bill to see if we cannot correct that. When I say "we", I mean agriculture commissioners and farm groups in States throughout the country who are involved in this.

We need an emphasis in our research and agricultural extension programs on this kind of sustainable effort. This is an enormous and a very productive asset that we have, the extension and the research community.

There already is movement in that direction by a number of the Land Grant colleges, who, I would say two years ago, much less 10 years ago, could not form their lips and tongue to say "organic". They are now offering some courses in that, and working up some programs at the local level to make it work.

A third barrier that we have is capital. It is very hard for farmers to get money to make this transition, and you do need a transition period of three to five years to be able to shift your production. There may be a decrease in yield at the start of that.

We have got to look for ways to get the capital in to do it. If you go into the Farmers' Home Administration in an East Texas county, and say "I am going to raise blueberries. We are going to use drip irrigation, and we are going to raise them organically," they are going to say, "That is not agriculture. We do not finance that. We will finance your hay crop and your cattle crop," and you can say, "Well, I'm going to lose $400 an acre on that, and I can make $1,000 an acre on blueberries."

And they say, "Well, that's not agriculture."

We have got to change that bias, and that is the final barrier. This Congress is working through your committee and the agriculture committees to begin the shift to make Government programs recognize that this is real agriculture.

It is real in the sense that it is profitable agriculture. It is environmentally and economically sound agriculture. It is an agriculture with a future attached to it, but first we have got to move the barriers in Government programs.

In Texas, the Texas Department of Agriculture is the lead agency for pesticide enforcement in our State.

We are encouraged by the changing attitude that we are getting from Mr. Reilly at EPA, and we are pleased with the impetus that you are offering from this end of Pennsylvania, Constitution Avenue here, to put the pressure on there.

We need the same thing in the Department of Agriculture—the Farmers' Home Administration for sure, and throughout that agency.

There is a movement, by the bye, in the U.S. Department of Agriculture to abandon the natural label that is offered to livestock producers who do not use steroids and chemicals in their livestock production. At the very time that the market is expanding for this kind of a product, the USDA is futzing with the label that would certify this product and assure the consumer that they were getting what they need to be getting.

We need to be taking a look at that, as well. We have got to change the attitude. If we change the attitude of Government, then Government can be a service, that can put the tools of change, of transition in agriculture, in the hands of the farmers themselves.

If you do that, the farmers will pick up these tools, and they will make them work, and they will respond to the market in a way that will put profit back in agriculture.

I would be happy to answer any questions.

Senator **Reid**. We will make part of the record a statement of Jim Hightower regarding Burke Slaughter. [See p. 62.]

Commissioner, as we indicated earlier, we are pleased that you are here.

I personally would like to compliment you on some of the innovative things done in the State of Texas that I think have gone well for the country.

For example, your leadership in the area of non-hormone-injected beef that you briefly mentioned—that certainly has set a tone that indicates that there is at least another school of thought that we can compete, and compete on the international level, by doing things the way that it was done in the past, without all these artificial things. So I appreciate that.

The press, the grocery industry and State and local officials have expressed major concern over the safety of our food supply, especially in the last year. We have letters to the committee and to myself that indicate that the Federal agencies appear to have lost their credibility as protectors of the food that we eat.

Now, whether this is a reality or just a perception, the fact is that perception, many times, is reality in the minds of the people.

How do you think this perception has developed? What has happened, and what should we do about it? That is, that Government cannot adequately protect us from the harmful chemicals added to the food that we are given to eat?

Mr. **Hightower.** Well, I think we go through cycles.

From Lincoln Stephen forward, with his exposé of the contaminants in the meat-packing industry at the turn of the century. A rush of Government response to that concern was forthcoming. It ebbs and flows.

Government regulators do tend over a period of time, to develop a cozier relationship with the regulated than they do with the folks that they are supposed to be protecting in the first place. That is not unique to food. We have seen plenty of recent examples ranging from HUD to the Department of Defense procurement practices here in this city. But it certainly does happen with food protection.

I think that attitude, that regulatory laxness, was unleashed in the 1980s. I would like to say it is all Ronnie Reagan's fault, and have said that many times. But the truth is, some of our Democratic colleagues in the Congress also allowed that to happen.

The public ultimately gets fed up. They get shocked, as in the case of Alar, and some of the other highly-publicized incidents in the last couple of years, and they begin to demand a response, and that is where we are today.

We are hearing that we have a kinder and gentler Government. We are watching to see it, but the public does not believe it.

No amount of rhetoric is going to get it done, no task force reports or studies are going to get it done. We are going to know it when there is actual credible action, when we bring the power of Government to bear on the public interest. In this case, very clearly expressed, not as a result of press hyperbole, is by consumer demand for safe food.

Senator **Reid.** Commissioner Hightower, you mentioned that you liked Bill Reilly, and we all do. We have confidence that he is trying to do a good job, and I believe that.

I think that he is assembling people around him who are good people.

One of the things that I am going to try to bring out in the next few months, as I have tried to do in the past, is that no matter how well-intentioned people might be, if you do not have the assets to do the job, you cannot do it.

There are tens of thousands of chemicals that are in the workplace. There are chemicals in everything we do. We are surrounded by chemicals.

The Environmental Protection Agency is lacking the human resources to even sort out what might be dangerous.

During the past eight years, the money that was spent on obtaining people that are being called upon to make our world safe from chemicals has been cut back, not increased, but cut back.

It is not very sexy to talk about somebody who works in a lab to determine whether a chemical is deadly, dangerous, or whatever other classification. It is certainly more sexy to talk about savings and loan ripoffs, or HUD problems, or exotic weapons of destruction.

So, I appreciate your bringing up Administrator Reilly, because I think he is trying to do a good job. But he will never be able to do a good job and the EPA will continue to be an agency that people have no confidence in, unless we are willing to put our money where our mouth is—and in the process save money.

I truly believe that by spending a little money, we save money in the long run by lost time from work, making people feel better, etc.

Would you comment?

Mr. HIGHTOWER. Sure. You are absolutely right.

Conservative Republicans are always fond of saying that there is no free lunch when they are talking about social programs. There is no free lunch when you are talking about economic programs, either.

If Government does not deal with the broad cast of chemicals that are in our society as you just reiterated, there are very real human costs. People die, for one thing. People get sick, badly sick. Economic loss flows from that.

And as one who heads a regulatory agency, it is fun in the press to talk about lowering budgets, but it means you are lowering the number of people who are doing the work to protect the public, when you lower those budgets. That certainly has been the case with the Environmental Protection Agency.

We have to put the money there. And people say, well, the money is not there. But it is kind of strange that the savings and loan associations came in here, and we found $200 billion for them. Let us get the money.

Senator REID. Commissioner, one last question.

Given consumer fears, and the Federal agencies' track record in obtaining compliance, do you think that supermarkets, food chains, and the like need to do independent testing, even though the Federal Government is the one responsible for this kind of monitoring?

Mr. HIGHTOWER. I think that is a very clear indicator of how low we have fallen—the fact that supermarkets themselves have had to step in.

Some say, "Well, the States should do that." Well, should we have 50 State testing facilities, when we could have one operating on this? Food safety is a responsibility for all the people, and it is a responsibility that properly belongs to the National Government.

Though I am a States' Rights advocate for a lot of the initiatives that need to be taken, nonetheless there are certain responsibilities that are just more efficiently handled at a National level.

Those supermarkets are moving into that kind of testing—very expensive testing, I can tell you—because they have no choice. The consumers are demanding that the very base of the food supply, its safety, be assured, and if the Federal Government cannot do it, in order to sell their food, the supermarkets are having to move into that themselves.

That is a cost that their own consumers often are having to bear. I know that some of the smaller supermarket chains are interested in doing that themselves, but they cannot afford the equipment. It is a responsibility of our National Government to ensure the safety of our food supply.

Senator REID. Commissioner, referring back to my statement, the information I have is that approximately 1.2 billion pounds of pesticides are sold each year.

Would a low fee, one to three cents per pound, on these pesticides, hurt farmers?

Mr. HIGHTOWER. No, and you can actually put that fee on the chemical manufacturers themselves in a way that they cannot pass it along to the farmers.

Iowa has imposed a mill fee on pesticide, and I think even on synthetic fertilizer sales. I am not positive about fertilizers, but the fee is placed on pesticides, insecticides and herbicides.

We are contemplating legislation to create a similar fee in Texas. It need not even be one or three cents. Three mills, five mills, can raise a humongous amount of money which then can be put into this kind of research.

Maybe you are talking about a Federal fee—then it should be put into the kind of EPA staff work that you are talking about into additional research on sustainable agriculture methods and biocontrol methods.

Senator REID. Something that we will look into in more detail.

Senator Lieberman.

Senator LIEBERMAN. Thank you, Mr. Chairman.

Commissioner, just to again say how appreciative we are that you are here, and how much we admire what you have been doing as a leader in this area before a lot of the us appreciated the problem.

In another context, someone said that people are speaking with their feet. I think the public here is speaking with their mouths, and part of what is happening is that there is a growing sense that there are enough risks that we choose to take in our lives. We ought not to have risks forced on us when we buy fruits or vegetables or other food products.

That is the chorus that I feel rising, certainly, as I talk to people back home in Connecticut.

I appreciate the tone of your testimony, and the content, because it suggests that this ought not to be an area in which consumers are aligned against farmers, that the farmers here are victims as well—perhaps larger victims in that sense, and that we ought to do whatever we can to help them.

You said something at one point in your testimony that I want to ask you to expand a little bit on, and it is that Federal agriculture policy now may actually encourage or push farmers into greater use of pesticides and away from natural farming.

Tell me more about that.

Mr. HIGHTOWER. Well, the very thrust of the Farm Bill is for the farmer to take a very cheap price per bushel, per bale, per pound.

If you force that on the farmer, as present farm legislation does, then farmers have to try to make up in volume what they cannot get in price per unit. Farmers are at least as quick as you and I are, so they have figured out if you are going to set aside acreage, you are going to set aside your worst acreage, and then you are going to fertilize the hell out of what you have.

So we have these farm programs that are designed to cut production that in fact result in higher production—higher production that comes as a result of heavy inputs of synthetic fertilizer and as a result of high chemical use on that farm, which then adds to the cost of his operation, which means the farmer really is spinning his wheels and not getting ahead.

The price in the marketplace has fallen, and he has to turn to the taxpayer to the tune, Nationwide, of several billions of dollars, which is not where the farmer wants to get the price in the first place.

So we have got to shift our focus away from forcing farmers to get ever bigger and to get ever higher yields. The world is awash in wheat. We do not need more wheat.

Bangladesh exports wheat now. We need to be looking at diversification of that agriculture, and into sustainable agriculture methods on those farms. Farm policy needs to shift toward that family unit and toward the economic, cultural and social advantages that we get from that farmer.

Not because we want to do the farmer a favor, but because we want a safe, ecologically safe agriculture.

Senator **Lieberman**. I know this is probably discussion for another forum, but just in brief, how would you change Federal farm policy now to encourage less use of pesticides and chemicals?

Mr. **Hightower**. Well, that is complicated, but there would be, certainly, an effective supply management system for the commodities within the farm program, which would be based not on acreage but on bushels and bales, so that farmers would have no incentive to try to produce more on the acreage they do plant.

That would allow and encourage more crop rotation, which would encourage diversification on agriculture. Now there is disincentive toward that.

I would shift substantial amounts of the research and extension effort into diversified agriculture, into sustainable agriculture, into direct marketing. And I would try to shift the lending agencies of Government, not only into this kind of new beginnings agriculture, but also to use their influence to leverage private capital into this sort of agriculture.

So it is going to take a comprehensive sweep. Making these changes is not going to be done by the existing farm commodity programs.

The attitude of Government has got to be what are we trying to create, what do we want that farm to be? What do we as consumers want?

Let us go back to the beginning, not start with what is in the laws. Here is the ag code, stack them up over here at the end of the table and let us start through it.

Let us go back to basics. Why do we have farm and food policy to begin with? Who are we trying to help?

Senator **Lieberman**. Sure. You are asking all the right questions.

Let me go now to the State level. You mentioned your certification program and a seminar you conduct.

Do you have an active program through your agriculture department to assist farmers who want to make this transition?

Mr. HIGHTOWER. Yes, we do, in a number of different ways, and it does include that sort of outreach effort in seminars and meetings. I am happy to report that the Land Grant college system, Texas A&M, including the extensive service, is being very cooperative in these efforts.

We are beginning to have the total institutional infrastructure of agriculture in the State make this shift.

We have developed some direct grant programs, making very small grants, to institutions to do research in these areas, and development in these areas, and also some grants and loans directly to farmers to make the transition.

We also created something called the linked deposit loan to bankers. The State treasury holds money, but puts those deposits in banks, private banks. The State is paid interest.

What the Linked Deposit program does is say to that banker, if you will loan that money for a farmer wanting to diversify agriculture, or practice sustainable agriculture, or direct marketing, then the State will take two percent less interest than it otherwise would receive.

This leverages a great deal of private capital as well as this little dab of State deposit money, and the result is that we are actually diversifying our agriculture, and we are gaining more money in the State treasury, because farmers people are paying taxes.

Senator LIEBERMAN. Just for the record, I think it would be important if you could briefly describe how a farmer gets rid of bugs and weeds without chemicals.

I think that all of us, even if we are limited to our lawns and our household gardens, think that there is no way to do it without spraying something on, or putting some powder down.

Mr. HIGHTOWER. I am glad you add that last caveat, because this should not just be a rural phenomenon. We need the biological controls in the cities as well.

For example, probably the heaviest user of chemicals in the country is not you (for your lawn), and not the farmers—it is the golf courses in the Nation.

Senator LIEBERMAN. That is right.

Incidentally, we see, in our work on this committee with regard to clean water, that one of the greatest and growing sources of dirty water is runoff from pesticides on lawns, gardens and golf courses.

Mr. HIGHTOWER. There are natural insecticides, pyrethrins, that do in fact kill fleas and ants, as well as agricultural pests.

There are soap base sprays that can be applied. There are also tillage practices that do less to encourage bugs. There are irrigation practices that do less to encourage it. A lot of irrigation spends most of the water wetting the leaves of the plant, rather than the roots which really need it, and the wet leaves encourage pests.

There is a whole new cottage industry, a burgeoning industry of small enterprise out there—in this biocontrol world.

We have people in our State and I know of others around the country who are using bugs to kill bugs in grain elevators, and can eliminate the need for chemical use there.

But the FDA is operating in such a way that it is putting those people out of business. I can offer you a little background on this issue, if you are interested in poking into that a little later on. I would be happy to submit some material on that later on.

Senator LIEBERMAN. I would welcome that.

Mr. HIGHTOWER. There are Federal, Governmental deterrents to the rise of this biocontrol industry that would make cheap products, very effective products, available to farmers.

But you know, making these products is not something that can just be done in a hurry when the locusts descend, whether it is locusts or whatever. You have got to be out there, and you are going to grab whatever is at hand, because you have got to defend your crop.

And if all farmers have is what nine chemical companies are offering to them, then that is what they are going to have to grab.

We should encourage this new biocontrol industry to come out, because it is effective. We see it work.

Senator LIEBERMAN. Does the State of Texas have stricter pesticide control regulations than the Federal Government has at this time?

Mr. HIGHTOWER. In some areas, we do.

Senator LIEBERMAN. Let me ask you a final question about the impact on consumers.

Is it inevitable that the cost of food that is grown or prepared naturally, without chemicals will be greater?

Mr. HIGHTOWER. No, that is a base canard. There are really two attacks always leveled on organic produce.

One is that it costs so much more. Now, generally, it does cost more, but that is because organic food, like all food, is susceptible to Economics 101. There is not enough supply.

You get your supply up, the price is going to come down. So it is not a function of the production technique. What we are finding is the production technique is less costly. Price is a function of supply.

The second attack on organic food is that it is going to be ugly, and consumers just are not going to like it. In fact, I can take you in any market, anywhere, I think, in the country—certainly in Texas—and the organic tomato is going to be every bit as handsome as the——

Senator LIEBERMAN. Except in Iowa.

Mr. HIGHTOWER. There you go.

Senator LIEBERMAN. Actually, were involved with Alar, they told us—and I guess they are right—that apples that did not have Alar may not look as good, but the folks back here wanted to give me an organically grown tomato to prove that it looks as beautiful as all the others.

Mr. HIGHTOWER. And it has something unique in there, too, which is flavor.

I think you will enjoy it.

You know, it is really just common sense. My mama always told me, do not put anything in your mouth unless you know where it came from, and I think that is what we are talking about.

Senator LIEBERMAN. God bless your mama. Thank you.

God bless you too, Commissioner.

Senator REID. Thank you very much, Commissioner.

Our next witness will be Linda Fisher, who is the Assistant Administrator for Pesticides and Toxic Substances in the Environmental Protection Agency.

She has with her various people from her office, and she will identify those for the committee.

You may proceed.

STATEMENT OF LINDA FISHER, ASSISTANT ADMINISTRATOR FOR PESTICIDES AND TOXIC SUBSTANCES, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY VICTOR KIM, DEPUTY ASSISTANT ADMINISTRATOR; RICK TINSWORTH, DIRECTOR, DIVISION FOR REREGISTRATION; AND ANNE LINDSEY, DIRECTOR, DIVISION FOR REGISTRATION

Ms. **Fisher**. Thank you, Mr. Chairman.

I appreciate the opportunity to be here today to discuss with you the Agency's role in assuring food safety through our regulation of pesticides.

I am joined at the table today by three of my senior managers of the program, whom I would like to introduce.

To my left is Victor Kim, who is my Deputy Assistant Administrator.

On my immediate right is Rick Tinsworth, who is the director of the Division for Reregistration. On his shoulders falls the huge task of reregistering all the old pesticides.

To his immediate right is Anne Lindsey, who is the division director for registration. Her division is responsible for registering new chemicals that we want to get onto the market.

Senator **Reid**. She is the one that has no staff.

Ms. **Fisher**. She has some staff.

She keeps lending them to Rick.

As a newcomer to these issues, I am impressed with the highly complex scientific issues and the very difficult public policy questions that face the Agency as we try to implement the pesticide laws.

I am excited by the challenges, and I feel privileged to be a part of shaping the programs at the Agency to deal with them. I assure you, it is an enormous job.

Recently the public's confidence in EPA's ability to adequately regulate pesticides was shaken. Questions were raised about our ability to move quickly to remove troublesome pesticides from the market.

Public concern about food safety led to tremendous disruption in the apple industry. I do not think we can afford to let another Alar-like situation happen. It was bad for consumers, it was bad for the farmers, and quite honestly, it was bad for those of us in Government.

I believe that an effective EPA program is a large part of the solution to this problem. Today, I would like to discuss with you our efforts to improve and strengthen our management of the pesticide program.

In many ways, these recommendations mirror the recommendations of your report.

A new day is dawning in the world of pesticide regulation, and it is being forced by three things: first of all, last year's passage of the amendments to FIFRA, FIFRA '88; second, public concern and involvement in the pesticide program; and third, leadership and staff at EPA that are committed to moving the program forward.

Although originally referred to as "FIFRA-Lite," the amendments that were passed last year by Congress have had a profound impact on how we regulate pesticides. They put the agency and industry on an aggressive schedule for reregistration, and they shifted many of the burdens that had been on the agency to industry, where they more rightfully belong.

I would like to walk you through one of the charts that was attached to my testimony, because it lays out the management structure that we will be dealing with for old pesticides, as it was set out in FIFRA 88.

First of all, the Congress directed EPA to establish four lists, which are called Lists A through D. For lists B through D—and at the bottom of the chart, you can see this—the Congress set a phased schedule for action.

In the law, they set specific dates by which certain things had to happen, and I will go through what all those activities are in a minute.

List A is made up of the high priority, high volume food use pesticides. There are approximately 194 of those, and they are the chemicals that the Agency has already taken some action on.

The amendments last year did not set a specific statutory schedule for our dealing with the A list chemicals because we had already taken some action on them. What we are doing at the Agency is to set a chemical-specific schedule for each of those, and that schedule will be finished by the end of, I believe, this month, or the beginning of next month, and we will furnish it to the committee when we have completed it.

The Congress also set forth the five phases of activity that each of these lists had to follow, and the deadlines by which they had to be met.

In Phase I, which is to the far right, EPA was given deadlines by which it had to publish the four lists. We have met each of the deadlines. The fourth one is coming up next month.

We had to publish the lists, and ask the registrants whether or not they intend to stay in the game and continue through the reregistration process.

In Phase II, the action shifts to the industry. They must respond for each chemical on their list whether they intend to pursue reregistration. They have to identify existing data-gaps against the requirements that the Agency has set out, and they must make a commitment to fill those data-gaps.

Additionally, they have to pay the first portion of a reregistration fee, which will for major pesticides be approximately $50,000. I should note that, earlier this year, the registrants had to pay a very small fee on a per-product basis. The mere effect of having to pay that fee was the drop-out of approximately 13,000 products that are currently in our inventory.

We anticipate that there will be another self-purging of the system as companies have to make chemical-by-chemical decisions as to whether they want to go through with the testing and pay the much larger reregistration fee.

In Phase III, the action stays with the industry again, as they are required to summarize and re-format all their old studies and ensure that they will meet the agency's standards. Additionally, corporate officials are going to have to certify that the raw data are available to back up those studies, and that they are accurate.

The companies must flag any data which indicate there might be a problem with the chemical. They also must pay the remaining two-thirds, or $100,000 of the registration fee.

We believe that this will lead to, again, another purging of the system, as companies identify old, out of date or bad quality studies.

The agency is going to take enforcement action against any false certifications concerning the data behind studies.

We anticipate that more chemicals and products will drop out of the process as companies realize how expensive it is going to be for them to continue through the reregistration process, or as they realize that the old chemicals may not in fact survive the more intense studies that they will be undergoing.

In Phase IV, the action shifts back to EPA. We will be called on to review all the submissions of data, again identify any additional data-gaps, and issue a data call-in to the registration.

Failure of the registrants to satisfy these additional data demands can lead to immediate suspension of a chemical.

In Phase V, the action will stay with EPA again. It will be at this point that we will be reviewing all the data that have been submitted and making decisions on which chemicals we are going to re-register, what crops they will be able to be used on, and how those chemicals will be used, in order to minimize exposure.

At that time, we will be able to include limits on application in terms of amount or the timing of application or the method of application.

We will also include in this process the setting of tolerances on a per-food basis, in accordance with the requirements of the Food and Drug Act.

At the end of this process, therefore, all chemicals will have gone through a new review, based on new science, and the agency will have established both registrations for the farmers to follow and the appropriate tolerance levels that the food must meet.

At any time during this process, if the Agency has reason to believe that there is concern about a chemical, we can put it into special review and move to cancel it, or suspend it, if the data indicate a significant problem.

We are currently retooling the management of the program to deal with this monumental task. We are staffing up. We are improving our communications systems. We are putting in sophisticated computer systems.

Even our mail handling system has been changed to handle the influx of information we are going to receive that has been forced by these amendments.

I appreciate the concern that you expressed in your report about the management of the program. We are giving it high priority attention, and I think we have done a lot to address some of the problems that have plagued the program in the past.

Although FIFRA'88 improved the world of pesticide regulations considerably, it did not change the protracted and often frustrating decision-making process that the agency must go through in order to remove a chemical from the market. Nor did it address the inconsistencies between the two statutes, FIFRA and the Food and Drug Act, that govern the regulation of pesticides.

I read with great interest the Committee's recommendations on improving the statutes. As you know, they mirror many of my own thoughts, especially those that deal with streamlining our decision-making process and making a more consistent standard by which the agency is to set tolerances.

It is clear to me that as we move through the FIFRA 88 process, we will be learning more and more about old chemicals. A lot of the data we receive are going to indicate that we have some chemicals that are troublesome to us. It is essential that we amend FIFRA and enable the agency to move quickly to remove these chemicals from the market.

I believe that legislative changes are necessary if we are going to maintain the public's confidence in Government's ability to guarantee a safe food supply.

As you know, I have been working very hard within the Administration to develop a package of legislative proposals for the President. We are very close to a final decision on that package, although the President has not finally made it yet.

Let me touch on another issue that was raised in the committee report, and also during my confirmation hearings—that being the Scientific Advisory Panel.

You have expressed concern that there was no member that had training in either public health or pediatrics. I have recently sent a letter to the National Institutes of Health and the National Science Foundation, asking them to actively recruit candidates with these background, and the requisite technical training.

I have also encouraged hem to identify candidates that represent a broad perspective, a broad philosophical perspective, on these issues.

You will be interested to know that the recent solicitation to fill a current vacancy, or the vacancy that opens up this month on the panel, did include one candidate that was a pediatrician.

I would like to take credit for it, but unless he was following my confirmation hearings, I do not know that he realized that we were going to be looking for those types.

During my confirmation hearing, I also committed to reviewing with our general counsel opportunities to strengthen our disclosure requirements for the members that are on the panel. That work is actively underway.

Specifically, we are looking for ways to increase the public disclosure of past consulting relationships of panel members, and to minimize their current consulting relationships on pesticide-related issues. As soon as we have finalized the review, I would be happy to share that work with you.

It is very important to me that the public have confidence in both the technical competence and the objectivity of the scientists who influence the important decisions about the hazard of pesticides that we make.

I am very interested in improving our internal procedures to guarantee that.

I also share Bill Reilly's commitment to pollution prevention in the area of pesticide use. That translates into reducing the amount of pesticides that are released in the environment.

Although we need to preserve the beneficial uses of pesticides, I believe we must protect public health and the environment by eliminating unreasonable and unnecessary risks that are posed by pesticides.

I believe that we need to encourage more the development and the use of the integrated pest management or other alternative techniques. I was very heartened to hear the activities that are underway in Texas to that end.

I think the National Academy of Sciences study will be a very real contribution to this effort.

EPA currently has a number of activities underway to work with the extension service to increase both the knowledge and the transfer of information concerning these new techniques.

In addition, I also am interested in working with the Department of Agriculture to develop a closer relationship between ag policy and environmental concerns. In particular, I am also interested in examining and adjusting the incentives that encourage the unnecessary use of pesticides that you were just referring to.

I am encouraged by the increased interest and participation of the public in the issues of food safety. I believe that a well-informed and involved public will lead to better Government decision-making. This of course is going to put a larger burden on the agency, to de-mystify how we regulate pesticides, and better explain how we make our decisions and why we make them.

We must do a better job, I think, also, of communicating risk, perhaps one of the greatest failures in the Alar incident. I believe it is worth a substantial effort on the part of Government to educate people and to bring them into this process.

In closing, Mr. Chairman, I want to assure you that I am all too aware of the problems, both perceived and real, facing us as we manage the pesticide program.

I accepted the job, however, because I wanted to be a part of dramatic change in this program. It is literally on the cutting edge of environmental policy and agricultural policy. It is a change, as I said earlier, that was forced by FIFRA 1988 that has been fostered by public concern and involvement and very much encouraged by the leadership at EPA.

I am committed to moving this program forward. I take great pride in having some of the agency's best managers, three of whom I have brought with me today, to assist me as I meet these challenges, and I look forward to working with members of this committee to make great improvements in this program in the months ahead.

I will be happy to answer any questions that you might have.

Senator REID. Thank you very much.

Recognizing that you do not make the ultimate decision, I would, however, ask that you and your staff provide the committee with some proposals to double or triple your pesticide program budget, which is currently between $70 million and $80 million.

My suggestion is that this money be raised through some fees on the sale or use of pesticides, or some other ideas that you might have.

We have heard that even with the fees raised in the 1988 amendments that you will still need more. Again, recognizing that you do not make the decision how these fees are to be raised, or should they be raised, but the committee directs that you give us some ideas as to how it could be done with the tools that you have.

In the subcommittee's report, there are 12 recommendations set forth, most of which focus on what the agency can do within its existing authority to improve and strengthen the pesticides regulation program.

If the agency concludes that additional authority is needed to implement these suggestions, we hope that they will come to the Congress with legislation that includes such authority.

Having said that, what ideas do you have as to what management systems does the agency have in place to monitor the status of the overall review of pesticides? You have given us a brief outline, but more specifically, the status of overall review of the pesticides? Not necessarily how you do it, but how much you have to do?

Ms. FISHER. In terms of the numbers of active ingredients we will be reviewing, we currently think the number is approximately 600. As I said, they are divided in four lists. The top priority list has 194 on it.

We are in the process, as I mentioned earlier, of establishing new management systems to deal with handling this huge workload, and I can ask Rick Tinsworth, perhaps, to go into a little bit more detail of exactly what we have set up, in terms of systems, to manage the influx of data and information we are going to be receiving as we go through reregistration.

Mr. TINSWORTH. I think I can actually do that fairly quickly. I can give you a sob story and a success story, I think, and a promise and a commitment.

I would like us all to go back to about a year ago, August of 1988, when there was one division in the Office of Pesticide Programs responsible for both registration, re-registration and special review.

Senator REID. How many people were in that department?

Mr. TINSWORTH. It was about 140, 150. There were nine product managers who had to handle literally thousands of registration actions.

We had to twist their arms to get them to do registration standards, which were the documents dealing with reregistration. And after all that was done, there were just no resources to do any follow-up. So we would get a document out, but we could not keep track of the status of the data.

We had computer systems that were kind of Rube Goldberg, stuff put together because of a lack of resources to do it right. And now, that is the sob story.

I think the success story, although it is clearly not visible to anybody outside the agency, is that I believe in the last 12 months we have basically gone back to ground zero, and tried to build the infrastructure so that we can respond to the very big challenge we have ahead of us on reregistration.

And as Linda said, it ranges from cleaning out the mail room and the file room to pretty much dumping the old computer systems in the trash and starting from scratch, and writing systems and developing systems that will let us track information.

If we do not have ways to control and monitor the flow of the information and data, if we do not have the right quality control checks in place, we are just going to drown in paper. So we know we have to have the basic building blocks developed, and we think we are pretty close.

We also fully recognize that over the next couple of months, people are going to be looking pretty carefully to see if we start coming out with some results.

It is correct that there are about 600, we think—actually they are cases, 600 grouped active ingredients. There are actually about 1,000 active ingredients we have to deal with.

We are on target on lists B, C, and D, meeting statutory deadlines, but we know that List A clearly contains the most important chemicals at this point in time.

We are right at the point where we can almost tell you the status of all 194 List A chemicals, and that was tremendous task. We still have 30 boxes of letters and paper to go through, to get everything loaded into the system, but we believe that by October we can say, "Here's what we know about the 194 chemicals, and here's what we will accomplish during 1990, and here's our rough schedule for finishing off the List A chemicals, which includes the primary food use chemicals."

Senator **Reid**. One of the things about which I am concerned is the neurotoxicity testing, and the success or failure of the EPA to test adequately for these effects.

It is difficult to accept a statement that a pesticide is safe if the agency has not completed its testing for all possible risks.

Do you have ideas as to what types of neurotoxic testing the agency is proposing to begin, if it is going to begin at all?

Ms. **Fisher**. Mr. Chairman, the agency is in the process of developing guidelines for neurotox testing. We also consider it a very important area that we need to know more about with respect to the chemicals that are going through the re-registration process, as well as new chemicals.

In fact, next week, the Scientific Advisory Panel is going to be reviewing those guidelines. In the meantime, as the process for developing these has been ongoing, we do require on a case-by-case basis registrants to do neurotox testing, where we have reason to believe it might be of concern in a particular chemical.

So we are moving to address a blanket requirement, and put the guidelines in place for that type of testing. That is on track.

In the meantime, on a case by case basis, we can require it.

Senator **Reid**. At the hearing that we had in May, issues were raised regarding the testing done by the Federal Government to ensure that products are not treated with pesticides that are no longer allowed on the market, or with too much of any given pesticide.

I would like to hear from you—and I know that you are new in your job—but do you feel that adequate testing of food products is now being done?

Ms. **Fisher**. As you know, the testing, the monitoring of residues is done largely by FDA. It seems as though every time I have testified with Frank Young, who is the administrator at that agency, or been in a private meeting with him, he complains that he does not have enough resources to do enough testing. So I will merely quote him.

I think he is frustrated by the lack of resources devoted to that.

At the same time, the testing that is done does indicate for the most part that residues are below the levels that they are required to meet, and therefore there is no indication that, even though testing may be inadequate, the testing that we do does not indicate that there is a significant problem.

Senator **Reid**. What can EPA do in conjunction with FDA to improve our detection processes?

Mr. **Tinsworth**. I think there are a couple of things that are actually in process, and some other things that clearly need to happen in the future, not the least of which is what is ongoing right now some improved coordination and communication, both with FDA and USDA, so that when we get close to a final decision on a chemical, they are prepared to implement whatever enforcement is necessary.

As we move through the decision-making process, we have whatever data they have. It is available to us to help us in decision-making, and I think the real clear thing that needs to be done is some improved methodology, to try to expand the use of simpler, cheaper residue methods so that it is easier for FDA to sample more products. You can get more resources to run expensive methods, or get more resources to run cheap methods.

Senator **Reid**. Do you agree with Commissioner Hightower that whatever testing is done, there should be some National standards set, so that you do not have Nevada doing their testing on a certain food or food product, and then you have Iowa or Arkansas doing a different one.

Would it not be better to have a standard test for a product?

Mr. **Tinsworth**. I think that clearly having things standardized helps everybody, not only the regulatory agencies, but if grocery store chains are in fact doing their own testing, if there are questions about the quality control they are using, or the standard methodology they are following, that raises concerns for them.

And so I think it is very clear. The more standardized you are, the better and the easier things are.

Senator **Reid**. Senator Lieberman, do you have questions of the EPA panel?

Senator **Lieberman**. I do, Mr. Chairman. Thank you.

Good morning, and thank you for your testimony, Ms. Fisher.

I particularly welcome the sense in the testimony that this is a new beginning. Clearly part of the agitation that many of us feel about the regulation of pesticides happened before you arrived, but since you are there, we are going to direct all our anger at you.

But I do that understanding that you are new, and with a sense of optimism about the change you can bring about. In that sense, I appreciate what you said about wanting to take this job, because it is involved in the cutting edge of consumer and environmental concerns, and will require change.

Whenever you are involved in substantial change—I do not have to tell you—you are bothering some people, or you are bothering some interests, and you are going to be tested. You probably already have been, severely, to hold your ground, if I may put it that way. I just want you to know that I respect the challenge that you have, and that you will have substantial support from this committee, certainly, in standing up to those challenges.

I am not preaching here, but I can tell you of somebody that goes out and talks to people, and I think Commissioner Hightower reflects that same. There is a growing and very emotional demand by the American public, for safer food, and unfortunately, very often, I think the pressures that you may directly be subjected to are those from interest groups that are involved in what is happening now.

So let us try to do our best to listen and understand that the people out there who send us to Congress really want more protection for the food that they eat and feed their children with.

That is my invocation.

Ms. FISHER. I listened with great interest to Commissioner Hightower's comments. In fact, when I go back to the office, I want to see if I can solicit his assistance as I move forward and try to do something about the pesticide law.

I have not gotten, as you well know, a tremendous response from some of the interests, who like the law just the way it is, and I think—I listened to his Bible-thumping speech this morning and would like to have it unleashed, perhaps, on the legislative process.

Senator LIEBERMAN. I think he is willing. He is very committed to this.

Just as a starting point, do you agree that the system that has existed is flawed? In other words to wait 16 years after the first indications of carcinogenic effects from Alar, and now 18 with EBDC is just too long, and that we have got to change the way we have regulated pesticides?

Ms. FISHER. Absolutely. I think there is no question that we need to move a lot more quickly to determine whether there is a problem, or to establish that there is not, and get on with it.

Senator LIEBERMAN [presiding]. I note that the chart that you presented us—and your testimony suggested it, but I just do want to bring it out—the deadlines that you have given us do not relate to List A.

Ms. FISHER. That is correct.

Senator LIEBERMAN. Those you are working on—those are critically important. Again, I am reading from your testimony. List A comprises between 80 or 90 percent of the total volume of pesticides used in agriculture in this country. So those are the biggies.

Ms. FISHER. Those are the biggies, and they did not set a statutory deadline for the activities that are set forth in Phases I through V. That is why the agency has gone ahead and set an individual schedule for each chemical that will try to mirror some of the timeframes anticipated or contemplated in the schedule set forth for the others.

We have done it on a chemical-by-chemical basis, so that it will reflect all the action that has already taken place on those chemicals.

In a sense, List A is a little bit ahead of the process, because we had action underway. But in a few weeks, we will have completed, as Rick said, our chemical-by-chemical review, where we will have established a schedule for each chemical, and we can share that with you.

But that will be in place of the statutory schedule that was set forth for list B through D.

Senator LIEBERMAN. I appreciate that, and obviously we would like that as soon as you have it.

Do you have a target date that you want to give the public? Say by 1992 or 1993, whatever, there can be some assurance that these major use chemicals are——

Ms. FISHER. Well, the schedule will be—some may move well ahead of others, depending on how much data we have in currently and how good the data are, and how much they have met the requirements.

So, some chemicals could actually move through the pipeline very quickly and be done by 1992. Others would be 1995, and at the outside, within the nine-year process that is anticipated in FIFRA.

I do not know. Rick, do you have any more specific——

Mr. TINSWORTH. Just real quickly, I think that there are some positive signs in List A chemicals. Twenty of them have disappeared—they are gone. So we are down into the area of 170, and I think that each year——

Senator LIEBERMAN. They are gone, taken off the market by the manufacturer?

Mr. TINSWORTH. For a variety of reasons, mostly voluntary industry decisions for business reasons, or whatever. But they are off the list. So we are working with a smaller and smaller universe each year.

Senator LIEBERMAN. Do you think those are ones that were taken off because the manufacturers were acknowledging that there were safety problems?

Mr. TINSWORTH. You would have to go back—each chemical, I think, has its own story. In some cases, I think it is strictly business. They just were not making the profit. In other cases, they may have seen a forthcoming regulatory action, because there was a risk concern. I think it was a variety of combinations.

Senator LIEBERMAN. Right.

Mr. TINSWORTH. But I think that most, as Linda said—we are kind of ahead, in one sense, on List A, because we are essentially in Phase IV on List A chemicals, getting the data requirements out, and so we will be moving into Phase V much quicker. Some chemicals will get done in the next couple years, and some will take a little bit longer because of the study requirements.

But if we see something hot, if we have a streamlined special review process, if we see a problem, we skim it off, dump it in there, and get rid of it that way.

Senator LIEBERMAN. When Dr. Benbrook was here, at our last hearing, I believe that he said if you took what he called the top ten chemicals and fully regulated them, that they would probably touch 80 percent of the problems that we have from pesticides.

Are you trying to, even within List A, focus in on the top ten targets?

Ms. FISHER. We definitely have priorities within List A, and in fact the 10 that the National Academy of Sciences identified, we have taken action on almost all of them of one sort or another. Actually, I think it is in my testimony, but if not, I can provide it for you.

I do want to point out—and I know you and I had this conversation before—that the world does get a little bit misled.

The assumptions underlying the National Academy of Science's report, although good assumptions, are not necessarily reflective of actual risk. Even though we are moving ahead on those Top Ten, I am not sure that they do actually represent 80 percent of the risk.

In other words, we will not be 80 percent of the way done, just by dealing with those 10. They are important, and they are very much at the top of our list, but I just do not want you or anyone else to be misled that if you take care of those 10, you can declare victory on 80 percent of the problem. There will still be a significant problem out there.

The assumptions they used in the report were very valid for purposes of the report and the analysis, and it was very good, but it a little bit overstates the importance of those particular 10 compared to the rest, the remaining many hundreds that we have to deal with.

Senator LIEBERMAN. Okay, well, we will give Dr. Benbrook an opportunity to respond, if he wants it, when he comes on.

Let me just say to you how important we view your work with these major use chemicals on List A, and I look forward to the report of the deadlines that you have set, when you have it done.

And you think that may be within a month that you can report to us?

Mr. TINSWORTH. In October, yes.

Senator LIEBERMAN. That is great.

And I want to note again that you are preparing legislation, is that right, that will give us some recommendations about how you feel the process can be strengthened by us?

Ms. FISHER. I am hopeful that the president will have made a decision. I know that I have said this before to the committee, but in the next couple of weeks.

The last time I said it, it was July.

Senator LIEBERMAN. Do you expect it soon?

Ms. FISHER. Yes, I do.

Senator LIEBERMAN. Okay.

Let me go to a couple of the other issues that we have talked about. The Scientific Advisory Panel, as you know, is a source of concern to us.

I appreciate that you indicated that a pediatrician is being considered among other specialists for a current vacancy on the SAP. Can I ask you today as you are before us—will you commit that this vacancy available now will be filled by either a pediatrician or a public health expert?

Ms. **Fisher**. Well, we have the one candidate on the list that we received, and we are going to take a very good look at him and his credentials. I will definitely commit to that.

I want to stop a little bit short of saying that he will actually have the job, until we finish the process. I think there are about 15 or 20 candidates whose names were selected for that.

But perhaps once we have completed the review of those candidates and get close to making a decision, you and I can talk about it.

Senator **Lieberman**. I would appreciate that opportunity.

I am glad that you have asked—is it NIH?

Ms. **Fisher**. We get a list of candidates from two—the National Institutes of Health and National Science Foundation.

Senator **Lieberman**. Right, and I gather you have now asked them affirmatively to look for lists of pediatricians, public health experts, and just suggest to you—I know you need a full panel. Perhaps if this one person is not to your standards, you might want to wait until they give you that new list before you fill that vacancy, because I think it will give us all some confidence that there is that other perspective on the panel.

Let me go to EBDC now. I appreciate the statements that either you or somebody else made at EPA that the manufacturers' voluntary withdrawal from certain uses did not end the consideration of the problem, and you might well go beyond.

Just as you look back at it, how do you explain yourself coming here new, why it has taken us 18 years now since first indications of a problem in 1971, and nothing has happened with EBDC?

Ms. **Fisher**. I have looked through the history of the EBDC incidents, and I can let Rick give a more detailed explanation of where we are.

I will say that part of the problem that we have had is similar to where we see ourselves in the current situation, and that is the quality of data. And as we did reviews in the past on EBDCs, we found, I believe especially with respect to carcinogenicity, that the data were not there to support the agency moving forward.

On one of those fungicides—the EBDC's are a family—the data was there to support our concerns about worker protection, and in fact, the agency took some steps in the 1970's to require additional worker protection.

We recognize the need to get more information on EBDCs, and in fact the National Toxicology Program, I believe, initiated a major study which we are currently using in our review of those chemicals.

They undertook that study in the mid-1980's, and we have just recently gotten the data from that, and they will be incorporated in our decision making.

So a lot of the delay will be the frustration of getting the quality of data necessary to indicate that the product is either a problem or not a problem, and to move forward.

I think that the schedule of FIFRA '88 will impose disciplines in both the industry and the agency to get the right kind of data, data that are of the quality that we can use to make our determinations, and also to impose a discipline on the agency to review it in a manner that is prompt.

Senator Lieberman. Do you understand why it took so long to get the data? How could we improve that process for other chemicals?

The other fact that comes out, from what I gather, is that the data today that is the basis for the manufacturers, for instance, to withdraw the product from some uses is basically a confirmation of what was found 18 years ago.

Mr. Kim. In part it is, and in part the newer information has really raised our level of concern—that is, the chemical and its metabolites appear to be more potent than we had previously understood.

Again, that period of time is hard to explain under any set of circumstances. The same concerns are there, I think. The newer data are enabling us, and obviously the registrants, to better understand the specific risks and view them as unreasonable, and begin to move to reduce the exposures.

Mr. Tinsworth. If I could just add—I think we can all run through history, but the bottom line is that there is no excuse for 18 years.

The fact of the matter is that today, at this point, we have the data from a good quality National Tox Program ongoing study, but we still do not have the residue data that we would like to have, so that we would really know what the risk is. We do not have that market-basket survey type of information.

Senator Lieberman. Why is that?

Mr. Tinsworth. We issued a call in for that information about a year ago, and the industry has begun to respond by collecting samples.

But I think it would be good for those of us who may be from the industry sitting in the audience to recognize that I do not think we, as an agency, are going to put up any longer with having us go out with a data call and say, "Give me the residue data I need to do a risk assessment."

They know their chemicals as well as we do. They know what health concerns there may be, and there is no excuse for the industry not going out and getting that information on their own, so that when we are sitting there looking at EBDCs, we have all the information.

We are writing to all the registrants within the next couple of months, kind of giving them that message. Don't wait for us, go get the data now.

Senator Lieberman. Good for you. And I agree with you.

I hope that they hear.

Do you need new authority?

Mr. Tinsworth. I do not think we need it. I do not think we need new authority as far as being able to require data, and I frankly think we kind of missed the boat. We should have issued the data call in earlier, and in an ideal world, the industry would have gone off and done it on their own.

Senator Lieberman. What is the current status of your review of EBDC?

Ms. Fisher. This summer, as you know, the agency was preparing a regulatory package on EBDCs, and in early September, the registrants—three of them—came in an voluntarily canceled use of the chemical on approximately 60 of the 73 uses that were registered.

We are recalculating or reexamining what it is the industry has proposed to determine the actual effect in terms of reducing exposure, and we are also trying to make a determination about what type of action the agency needs to take to complement that.

Additionally, we are looking to see what we need to do to effect changes in tolerances, so that imported fruits and vegetables would be held to the same standard that domestic ones are, that they would no longer be able to use the EBDCs on them.

So that work is underway: analyzing what the registrants have done, seeing whether the agency needs to look to cancelling additional uses, and looking at the appropriate action that we would need to take on tolerances.

Our original schedule to make a decision on EBDCs almost coincidentally would have been timed almost with this hearing, but the action of the registrant has set our activity back because of the additional analysis we have to do, and we are now targeting probably the end of October or the first of November when the agency will announce its action.

Senator **Lieberman**. Okay, we look forward to that. Obviously, we had asked the manufacturers to come here. I really regret that they did not.

As Chairman Reid indicated, there is going to be another phase of this program, and we intend to do everything we can to get them to come forward to explain their decision.

In their absence, I wonder if it is possible for you to at least report to us what they have said to you about why they have kept the product on some major foods that we all use, such as tomatoes, potatoes and grapes, and particularly because of the concern that has been expressed about what happens to those foods—again, particularly tomatoes in processed form, which all of us and our kids are eating in great volume?

Ms. **Fisher**. Let me make a couple of comments, Senator.

First of all, as you know, we thought it was a very positive move—historic, in a sense, that they would come forward and voluntarily cancel uses.

I assume that their goal was to reduce exposure to a point that they felt would be negligible or safe, or take care of the public's concern, and again, I applaud that effort.

They have not been particularly forthcoming on how they selected which crops. We did interact with them, and I will let Rick, perhaps, fill that out a little bit, because he is the one that actually did the meeting with them.

But it is my sense that as they selected which fruit and vegetables to cancel the use of the chemicals for, they took a look at what was in their own corporate best interest. I do not fault them for that—they are businessmen—and they looked to see how they could cancel the uses and get the exposure down, which was one of their goals, and minimize the impact on the particular companies.

My sense is that on crops such as potatoes and tomatoes, we know there are substitutes that can be used for EBDC's on those.

Senator **Lieberman**. Substitutes that they might manufacture, you mean?

Ms. **Fisher**. Or they might not manufacture. I do not know. That might be one issue to take into account.

Additionally, they kept uses on some crops that are not grown very much here in the United States, very small domestic market, but which might have a much larger European market, and they might have kept the use on those crops so that they could keep sales up overseas.

Those are speculations on my part, or on the agency's part. We did try to work with them to get additional uses, or different uses, cancelled.

When we approach that kind of decision, we do not look at it in a particular company's best interest. We look across the board and we get exposures down to a level that we consider to be safe, and we look across the fruit and vegetable line to see where the economic impacts can be minimized.

And to the extent that there are appropriate substitutes, and therefore the cancellation of a use would not affect a commodity, we might look to cancel that one and not another one. So we take a different perspective. I would like to think it is perhaps a broader, more public-policy oriented perspective, than they did, and that is why you would see a different mix of cancellations that the Government might take, as compared to what the companies do.

Senator **Lieberman**. No question, and again, I would encourage you to go forward in that way. Obviously the standards that you apply are much broader and more public-oriented than the standards we would expect manufacturers to apply voluntarily, and the reasons they might have left it on tomatoes might not relate at all to you.

So again, we are going to follow your decision with real interest. Did you want to add something?

Mr. **Tinsworth**. No, I think that pretty well covers it.

Senator **Lieberman**. Just a final word to restate about the tomatoes—I am struck by that data that we see that says that 50 percent of the risk to children from processed foods use of EBDC does come from tomatoes, and I would just ask you to keep that in mind as you go forward with this next stage.

I have heard some concern expressed about the EPA's decision in 1988 to continue many uses of the pesticide Captan, which the National Academy report in 1987 indicated was the fourth worst pesticide.

One of our concerns here is that on some of the crops where EBDC uses were withdrawn, manufacturers of Captan may try to make that the preferred substitute now.

I would like to have some assurance that in dealing with the EBDC problem, we do not create another problem—like pushing more use of Captan.

Ms. **Fisher**. Senator, a couple of points. First of all, we do attempt, when we make decisions to cancel pesticides, or cancel certain uses of pesticides, to look and see where substitutes are available, and to the extent that the market might flow that way, have we improved the world or made it worse, in a sense, by our action.

So we do try to look, especially in the case of fungicides, we have tried to look at what is going to be the true impact or the net impact of our decisions as we move ahead to select different uses for cancelling.

In terms of Captan—and I will let either Vic or Rick fill in a little bit more, because it was before my tenure—the agency's goal again was to reduce uses necessary to get exposure down to a level that was negligible. As we looked across the 48—at that time—registered uses of Captan, selected the number and the variety of crops to cancel the uses on that would get the exposure down, that was how we went about selecting the right crop mix to cancel.

Mr. **Tinsworth**. That is true, and I would just point out that what we tried to end up with was a list of still-registered uses that gave us negligible risk with the maximum amount of benefits left.

On the one hand, we were criticized for cancelling a lot of small uses. On the other hand, those were the same small uses that get us to an overall negligible risk in Captan, and those are also the same uses referred to in the NAS report that made Captan the number four chemical on their list.

Senator **Lieberman**. Okay. I have so many more questions, but we are drawing later, and I want to bring the next panel on.

Let me just make one comment, and then I want to ask you one final question.

This comment is just to pick up something you said, which I think is very important. We faced it with Alar, we are still facing it, and we will face it with other chemicals, and that is, as the pressure grows to better regulate chemicals in the food supply domestically, we have got to make sure that we are not allowing fruits and vegetables, particularly, to come into the country that are not so regulated.

So much of the fruits and vegetables that we eat today are imported, if we do not—to use the technical term—regulate or limit the tolerances here, then we are still going to have a public health problem.

Ms. **Fisher**. I think that is fair, and we are very aware of the need to deal with both the tolerance and our decision to re-register a chemical at approximately the same time.

As these chemicals come through the new process, the new reregistration process, we will be moving to do just exactly that.

Senator **Lieberman**. The final question is this: clearly there is—and Commissioner Hightower reflected it, and we will hear it in the next panel—there is growing interest in integrated pest management or organic farming, natural farming, and I think that maybe the role of EPA—one new role, as if you do not have enough to do already, will be to become advocates for—in addition to formal regulation of existing pesticides, an important role will now be to be advocates for alternative farming.

Do you agree?

Ms. **Fisher**. I do agree with that, and I see that as one of the new roles that I would like to see both the agency and particularly my office take on.

I will tell you that, having worked at the agency for six years and having had some exposure to other programs, the one thing that I have noticed is the absence of the right types of incentives on the agriculture community with respect to pesticides.

Superfund, as you know from your past life as an attorney general—because of the stringent liability scheme, has provided a tremendous incentive to corporations to better manage hazardous waste or not to generate it in the first place.

Title III, which requires most corporations—and farmers were exempt from Superfund, and I think for good reason—in Title III most corporations were required to publish data in their community about the kinds of emissions that they are spewing into the air.

Again, that law has provided tremendous incentives to corporate America to take a look within itself as to how they can better manage so that they are not emitting so much of these chemicals.

Again, for a good reason, the farm community was exempt from that. But what you see at the end is that a variety of decisions, although individually making sense, have provided no incentives from an environmental point of view to get a lesser dependence on pesticides.

In fact, in the farm commodity program, you see just the reverse. You see an incentive to use a lot more pesticides than perhaps would be necessary.

So I would like to apply a far more aggressive role in terms of trying to shift the balance, or the direction at least, of where the incentives are going, and perhaps as Commissioner Hightower did, to serve as more of an advocate of some of these alternative pesticide methods.

Senator **Lieberman**. Thank you for your testimony, and we look forward to working with you in the months and years ahead.

Ms. **Fisher**. Thank you.

Senator **Lieberman**. Now we call Robert M. Goodman and Dr. Charles Benbrook.

Mr. Goodman, Dr. Benbrook, we welcome you. In your case, Dr. Benbrook, we welcome you back.

The work that you have done has achieved some real permanence in the public eye recently. It could not have come at a better time in terms of growing public concern about chemicals in the food supply, and we look forward to your testimony.

STATEMENT OF ROBERT M. GOODMAN, MEMBER, COMMITTEE ON THE ROLE OF ALTERNATIVE FARMING METHODS IN MODERN PRODUCTION AGRICULTURE, NATIONAL RESEARCH COUNCIL

Dr. **Goodman**. Thank you, Senator.

We are very pleased to be here, and we are very grateful for the complimentary remarks made about this study which the National Academy of Science's press has recently released.

This is a report that came from a long, and I must say in the end protracted and somewhat difficult, process. Seventeen disparate members of the scientific community, very few of whom had specific professional affiliations with or attachments to what here has been primarily referred to as the organic farming scene.

I think when we started out this process, this study, the idea was that it could be finished in a couple of years. It took over four. That is not a reflection on lack of diligence on the part of the panel, but rather on the breadth and complexity of the problem, and also the conjunction of the timing of the appropriateness and need to study this question of management practices and technologies applied to production agriculture, and the very real problems that the agricultural community has faced—economic problems in particular—over the past several years.

Because your invitation and this hearing focuses primarily on the pesticide-related issues, and the pesticide regulatory issues, what we thought we would do this morning in our oral testimony is to divide the task. Dr. Benbrook will make some remarks regarding the pesticide related issues, and I will then make some further remarks about the conclusions of this study and some of the other research and policy-related issues that your committee might want to consider.

Senator LIEBERMAN. Dr. Benbrook.

STATEMENT OF CHARLES M. BENBROOK, BOARD ON AGRICULTURE

Dr. BENBROOK. Senator, yes.

I would just like to reiterate the major points made in my last testimony which are drawn from our 1987 report on regulating pesticides in food.

Many of these same points appear again in this report. We recommend that a negligible risk standard be applied consistently to new and old pesticides, to herbicides, insecticides and fungicides, and to residues in both fresh and processed food.

We recommended that the EPA apply this standard to the risks associated with or following the use of a pesticide on a single crop, adding together whatever fresh or raw foods are derived from that crop, plus any processed foods.

In other words, the risk from the EBDCs on tomatoes would be the sum of exposure from fresh-market tomatoes treated with an EBDC fungicide plus ketchup and all processed tomato products made from treated tomatoes.

We recommended that when EPA has knowledge that a number of pesticides registered for the same use—for example, the six or eight fungicides registered for use on tomatoes to control a variety of plant diseases—that EPA weigh all potential risks before regulatory action and after, taking into account likely substitution of other pesticide products.

I am pleased to hear Linda Fisher again report that they are beginning to do this, but I think it is important to note that the EPA has a long way to go before they have really fully acted on this recommendation, and that the regulatory actions the EPA is about to take on the EBDCs will be precedent-setting. If they do not consider the probable switch of farmers to Captan and Benomyl, I think I can convince you in about three minutes that the end result of the action could be an increase in risk.

Senator LIEBERMAN. I think that is a very important point, and obviously all of us are going to be watching carefully what the result of EPA's actions are.

Dr. BENBROOK. And the last recommendation in our report was that EPA should focus on the "bad actors." I would like to return to the issue of where the greatest share of potential risk is.

In our current report, the committee asked itself the question:

Forget a regulatory program approach—what can farmers do now that will make them more money, help them use biology, genetics and ecology to control pests, rather than chemicals? Is it realistic to expect that farmers could more quickly work away from risky pesticide uses by preventing the need to use them on the farms, so that the pressure for action at the regulatory level can be much reduced?

Obviously a major recovery in the real estate market would have made your problem of bailing out the Savings and Loan industry much less onerous. And the question that this MAS committee asked itself was, is there something out there in production agriculture that can be done, given the emergence biotechnology and other new technologies, that could really substantially alter the sorts of technologies available and hence the kinds of risk that might have to be accepted in the food supply?

The committee's conclusion is quite strong in that there are a great many proven alternatives that are being used more and more regularly, and which show considerable promise both to improve the economic performance of agriculture as well as its environmental performance, and ultimately to improve the safety of the food.

With that, I will turn the tables back to Bob, who wants to describe some of these technologies.

Senator LIEBERMAN. I would just like to ask you one question that comes to mind, before we do that.

Did you make a conclusion about cost to the farmers of the alternative methods?

Dr. BENBROOK. In many cases, we did. The reason that many alternative practices are being adopted, and are being refined by innovative farmers all over the country is, as Commissioner Hightower pointed out, they make the farmer more money.

The selection of agricultural practices and technology is very much driven by the farmer's sense of what is going to do to his or her bottom line. The selection of technology and production system is also tempered in some very important respects by rules, regulations, program provisions that are embedded in Federal commodity programs and conservation programs.

We highlighted in our report some of these federal policies for particular attention by the Congress, because it seemed to the committee that the last thing the U.S. Congress would want to do is spend scarce public dollars to prohibit or penalize farmers from acting upon promising new science and technology that public dollars have developed at our Land Grant universities.

So we felt quite strongly that that warranted strong attention.

Senator LIEBERMAN. I would like to hear more about that. Let us go to Mr. Goodman.

Dr. GOODMAN. Following up, actually, on that point, let me just call your attention to two tables on pages 344 and 345 of the report, which illustrate the significant reductions in per-acre pesticide applications on sweet corn grown under IPM regimes in comparison with non-IPM regimes in Florida.

On the economic side, there is documented here roughly $40 an acre difference in pesticide input costs that is saved in the case of IPM-based management.

We also highlight elsewhere in the report—I do not have the specific reference at hand—a dramatic decrease in the amount of insecticide that is today applied in the Cotton Belt as a consequence of IPM-based management.

Briefly, let me define, by quoting the report, what this panel is talking about when it talks about alternative agriculture.

The focus is on agriculture as a biological activity, and there is a scientific basis for that as well as the empirical or practical basis that Commissioner Hightower has remarked upon today, and has spent much of his career advocating.

Alternative agriculture refers to a group of systems of production that have as their features more thorough incorporation of natural processes, such as nutrient cycles, nitrogen fixation, predator-pest relationships, the ecology of what goes on in the agricultural ecosystem.

Reduction in the use of off-farm inputs, where the greatest potential to harm the environment and help the farmers and consumers; greater productive use of biological and genetic potential of plants and animal species; improving the match between cropping patterns and productive potential and physical limitations of agricultural lands, ensuring long-term sustainability of current production levels. In the opinion of the members of our panel, we must in our public policy seek ways of maintaining our current high level of productivity and quality of our food supply while decreasing economic costs of pesticides, and obviously avoiding both the environmental and potential food safety concerns of the use of pesticides.

So, we are not talking specifically about organic agriculture or organic farming, although that is a component, as is the case in Texas, California, and some other States. Organic agricultural practices and the market opportunity that, at least in the intermediate term organic agricultural practices have provided, is one of the incentives that can be sought, but certainly not the only one.

The conclusions that the committee came to, briefly, are that there are sufficient cases out there now of well-managed agricultural enterprises, farming systems, that nearly always use less pesticides, and nearly always use less synthetic chemicals of all kinds per unit of production than comparable conventional farms.

I have been asked, are these typical farms? And our case studies show that in many, many ways, their appearance from the road, the people actually doing the farming—these are typical farms. What is not typical about them is that for one reason or another—and there is a range of reasons why—entrepreneurial growers, usually outside the commodity programs, the farm support programs of the Federal Government, have sought new ways of producing a competitive, high-quality product and have done so successfully.

Alternative farming practices typically require more information, more management, more technology, but it is of a different kind. There is some focus in the agricultural research community, as there is the public discussion about this, about low input.

To some degree, that is a bit off the mark. It is a different input. It is inputs of genetic technology and it is inputs of management and tillage and other kinds of physical technologies that we are talking about.

As Chuck has remarked, Academy studies have previously pointed out that Federal grading standards are one of the public policies that tend to promote the use of pesticides. We called for alterations in those grading standards, in order to reduce those incentives.

Senator **LIEBERMAN**. Talk a little bit more about that.

Dr. **GOODMAN**. Well, I am not an expert about that, but there are a number of marketing orders and other kinds of policies that call for cosmetic standards that result in farmers using pesticides to a degree that is well beyond what is required for achieving a satisfactory product with high nutritional quality.

The point here is that there are, in our case studies, several examples now of growers using what we define as alternative agricultural policies with fewer or no pesticides who are producing a highly-competitive product, even at a cosmetic level.

Senator **LIEBERMAN**. That was one of the problems with Alar. I gather that one of its major functions is cosmetic. I guess it keeps the fruit on the tree a little bit longer. But part of what it does is make the apple, for instance, look better.

Dr. **BENBROOK**. Well, it makes it possible to pick an orchard once. It holds all the apples on the tree so that one picking is sufficient. When farmers do not use Alar, they either suffer a fair amount of drop, and hence a reduction in income, or they have to pick the orchards twice. So there is an increased cost or reduced income.

Senator **LIEBERMAN**. What are other ways in which you think the Federal Government discourages what you have called alternative agriculture by its policies?

Mr. **GOODMAN**. Specifically, we find that there are significant research needs in the public agricultural sector, to better define why those farm enterprises that use these approaches are successful, and to attempt to find why those who have attempted to use these methods have failed. There are clearly people who have failed.

In fact, in a couple of our case studies, there are examples of attempts to go beyond a given stage in the use of conventional farming practices that has not been successful. One of those examples is in organic rice production in California.

There are both technological needs and economic research needs to understand and then to better promote the uses of technology to meet the alternative agriculture agenda.

I think that it is clear from our findings that the integration of our considerable knowledge base in ways that are readily adoptable by farmers in different environments is not yet sufficient to allow growers to confidently, in a short period of time, make the transition from their conventional practices to alternative practices.

And then there are a whole range of policy-related issues regarding the commodity programs which the Commissioner this morning referred to, and I agree with everything he said.

Senator **LIEBERMAN**. Okay, how about EPA? Does EPA do anything in its pesticide program that might hinder or block alternative agriculture?

Dr. **BENBROOK**. Yes, Senator, I think that there are two very important matters of policy that are addressed very clearly and forcefully in this report that you hopefully will be able to explore with Linda Fisher in future hearings.

They both relate to the fact that the FIFRA statute is a risk-benefit statute, and in its wisdom, the Congress envisioned years ago that science and technology and farmers would progressively figure out better ways to control pests, and that as time went on, we probably would be able to have a cheaper, higher-quality food supply that poses progressively lower risk to the public.

In large part, that has come about. But there are two aspects of EPA's program that are fundamentally not working as Congress envisioned. One is the benefits assessment side of pesticide regulatory decision-making.

Nearly all the focus of the data call-in program, the reregistration program, and consumer concerns is on the risk side of the regulatory equation.

No one seems to ask the question "Do we really need all these materials?" It would suggest that in many instances we do not need as much pesticide as we have been using in the past.

So, as a matter of policy to implement and enforce the FIFRA law as written, EPA has got to do a more credible job of calculating pesticide benefits, taking into account more fully the non-chemical, genetic, biocontrol, IPM, kinds of options that farmers have available.

What EPA does now in estimating benefits involves a calculation at the returns to the grower with and without use of the pesticide, taking into account the likely prospect that the farmer will switch to another registered product. The EPA then calculates the difference in farmer income and calls that the "benefits" of the pesticide use.

But that calculation is not fully reflective of the range of options that are available to the farmer.

The second point that is very important is that Linda Fisher, as she discharges her responsibilities, has got to deal with both the old pesticides and the new technologies. Her office is responsible for putting in place the regulatory infrastructure for the next generation of genetic and biological technologies, many of which pose difficult policy and scientific questions about how to evaluate the potential risk from a genetically engineered virus that is going to control an insect that one of these pesticides is used on?

To the extent that EPA has been making very slow progress in facilitating the registration and easy market entry of this next generation of innovative biologically-based control technologies, they are holding back the future, which is going to change the risk-benefit equation. So that is another matter of considerable concern.

Senator **Lieberman**. A very provocative answer. Sometime in the future, we might want to get everybody back and pursue those questions together with EPA.

While we are on this general subject, as you know, there have been various proposals around—at least around the Capitol and Washington, lately—to change FIFRA and other food safety laws.

If you have seen any of these, how fully, if at all, do you think they address the recommendations that you made in 1987 or the new report?

Dr. **Benbrook**. I appreciate that question, Senator, because you are serving in an oversight capacity. Your subcommittee's challenge is to help identify areas where the FIFRA program, the statutes, the underlying regulations and the procedures are not really working cost-effectively, or using the best science, and serving the public's interest.

And you have identified a number of things in your subcommittee investigation that have been identified by many different committees of Congress in investigations over the last 10 years. These are not ad hoc problems that arise once in a while. They are structural problems that can be tied to the inconsistencies between the Food, Drug and Cosmetic Act and the FIFRA statute that almost certainly, will require legislation to correct.

I listened and was encouraged by the conviction of Senator Reid in wanting to provide EPA with additional resources. But Senator, I would ask you to share with Senator Reid my observation and firm conviction—in the current fiscal climate that this country is under—that it is incumbent on the Congress to fix some of these underlying problems with the agency at least at the same time additional resources are granted.

It does not matter how many people are working at OPP, if they continue to be forced to follow the current process and deal with a statute that is so embedded with statutory encumbrances to speedy action.

I just think there will be a very small return to the dollar in terms of public health benefits without legislative reform, and this problem is going to become very much more severe because there is so much new data coming into the agency. This new ETU study is just the tip of the iceberg.

Basically, in the next two or three years, there is going to be new, modern, toxicology packages come in several dozen pesticides, Toxicologists with knowledge of pesticides, predict that at least a third of these, are going to result in heightened toxicology concern.

Right now, EPA can deal with Alar in the spring of 1989, and they are struggling with EBDC's in the summer and the fall, and maybe there will be a new pesticide on the agenda late this year. But they are going to have to be doing 30 of these a year—30 to 40 including new product registrations—and they just are not going to be able to do it with their current tools and processes, because it is just too complicated a process.

So various Members of Congress, Mr. Waxman and Senator Kennedy, have come forward with pieces of legislation that have addressed parts of the problems.

Let me just say that the legislation on the Food, Drug and Cosmetic Act side that has come out of Henry Waxman's subcommittee that Senator Kennedy has sponsored on the Senate side has gone through a process of evolution, and I understand that a markup is about to occur in the next month or so on the House side.

Some important amendments will be adopted which, I am told, will bring that legislation largely into conformance, if you will, with the principal recommendations of our 1987 report.

That leaves undone important changes that are needed in the FIFRA statute, which is what EPA has to follow in changing the registration of any pesticides. And here is where some of the more difficult political challenges await the Congress—when you try to amend FIFRA.

Just last week, a new bill was introduced in the House by Congressman Roberts and colleagues on the Committee on Agriculture that is a long, comprehensive effort to try and get at these problems. But I think that a careful study of that bill will point out that it really does fall short and does not address a lot of the key needs.

In an attempt to build into the process some additional scientific review as well as review by Federal agencies, it actually will probably slow down the process. So from my assessment of the legislation that has been proposed, there are pieces that can be used in a comprehensive bill. But there has to be amendments to the Food, Drug and Cosmetic Act. There have to be conforming amendments in FIFRA. You cannot fix this problem from just one side or the other.

The Congress is going to have to marry two bills on the floor to do it, and I think the critical missing ingredient in all the bills is new authority for EPA to substantially reduce risk in a case like the EBDCs or Alar. EPA needs a new mechanism to reduce risk on an interim basis from where it is now or where it could be under published tolerances, to either a negligible risk level or close to it, while the EPA and the registrants collect data and go through the two or three year process that it is going to take to determine exactly how low that tolerance has to be set to really be safe.

The problem is that EPA has a red light or a green light authority. It has no way on an interim basis to substantially reduce risk. This problem makes it more difficult for EPA to face tradeoffs in reading regulatory actions on the EBDCs, Captan and Benomyl, on a dozen or so major, common crop uses.

There is going to be a high degree of crop substitution, and really the best thing for everyone involved would be to see substantial reduction in the use and the residue levels across all three of those products, but probably all three of them have a role to play somewhere in the kind of integrated management strategies that our affirmative Agriculture report emphasizes.

Senator LIEBERMAN. Your answer is right on target, and I hope we can count on your counsel as these various proposals go forward. Certainly we on the subcommittee under Senator Reid's leadership want to play an active role in the rewriting.

Mr. Goodman, I think you wanted to add something?

Mr. GOODMAN. I just wanted to make a more philosophical comment about the question of resources, and I do not have a position and I am not an expert in terms of what the EPA should or should not do with more or existing resources.

But I think that the Congress and your committee should carefully consider the alternatives, which include promoting new technology development and promoting the expansion of and availability and accessibility of proven technologies as illustrated by some of these case studies, where you will get at the question of pesticide use at a much more fundamental level—without, though, regulating or attempting to legislate just how farmers farm.

So I think there is a trade-off here, or a philosophical question that goes well beyond just resources for EPA or for FDA, and the example that I might cite is the contrasting approaches that two States have taken to the issue of pesticide contamination in ground water and other public concerns—that of California and Iowa.

In Iowa, there is great concern but a very strong focus on supporting the development and the promulgation of practices on the farm that will in fact reduce—and my bet is that it will reduce more quickly and more effectively and more durably—the demand for and the use of pesticides in agriculture than a purely legislative or regulatory approach.

Senator **Lieberman**. Let me ask one final line of questions having to do with EBDCs, and what you think about the manufacturers 'voluntary withdrawal, what you think the remaining risk is for the public, and what you hope EPA does.

I take it you take EBDC seriously?

Dr. **Benbrook**. Absolutely. Lawful risk from EBDCs—risk the Government can not do anything about—is probably the highest risk from any pesticide now that Alar is on the way out, and that is very clear in our 1987 report.

Let me just take this opportunity, if I might, Senator, to address the question of the distribution of dietary risk from pesticides, because I really feel this is a very important point, and I want to make sure that you understand what our report did.

In 1987, we were asked to look at the regulation of pesticides with the potential to cause cancer. All of our findings about risk, and the report's recommendations related to the regulation of pesticides with potential to cause cancer, and did not look at the potential tradeoffs between cancer and neurotoxic and wildlife and other problems.

So, all the statements that I have made when I testified in April relate to what we know about the distribution of oncogenic risk in the diet from registered uses of pesticides, and I stand by those statements.

In terms of the allowable risk that Government has sanctioned through the establishment of tolerances, the estimation at "worst case" maximum permissible risk is a purely mathematical process. The distribution of risk, in our tables, which you have studied before, show that 10 pesticides account for 80-plus percent of this "worst case" risk.

There is no major dispute on this point, although questions remain about the accuracy of risk extrapolation methods. More important is the question: what about the actual risk? Our committee talked at length about actual risk, analyzed available data at great length, and in their report the committee acknowledges that it did not have access to complete reliable actual residue and actual use data on all the pesticides studied in depth. To this day, nobody has the data. It has not been generated.

So we cannot analytically answer the question in a comprehensive sense, But it was the committee's judgment—and it is stated clearly in the report—that as this data is developed, the same conclusions will hold true. The distribution of actual risk will also be heavily concentrated in relatively few pesticides and relatively few crops.

Senator **Reid**. Could you say that again, please?

Dr. **Benbrook**. The distribution of actual risk in the food supply will, when we have total knowledge, be found to be accounted for disproportionately by relatively few pesticides and relatively few uses.

Moreover, it was the committee's judgment—and again, it is stated in the report—that the committee is quite certain that the ranking of theoretical "worst case" risks in the report will change some, but only modestly as more complete information becomes available. Some pesticides might drop off the list of the "top ten," a few might come on, but there will be a considerable degree of similarity between those two lists.

So I think that if EPA uses this new data, and the new analytical tools that they have, including the TAS system, I think they can identify a dozen or so pesticides—certainly with respect to oncogenicity—that potentially account, for the lion's share of risk is the food supply.

You know, it takes a lot of chemicals with a one-ten millionth risk to equal one use at one-one thousandth. So, I do believe that the basic scientific foundation of a strategy of targeting high-risk chemicals will be borne out.

But EPA still will face the task of having to balance all types of risk. Linda Fisher is exactly correct that when EPA deals with most of this oncogenic risk, there are still going to be a number of other regulatory problems that are brought about by immunotoxicity, neurotoxicity, wildlife effects, etc.

Now, to the EBDC voluntary cancellation request. I would point out that there is a public docket on the special review of the EBDC's. There is a letter in there on September 6—two letters on September 6 and one on September 15 that Rohm & Haas provided to me. They are a matter of public record, and they explain in great detail the logic of what they have done and why.

I am somewhat surprised that the agency has not provided these to you, because they are matters of the public record.

Senator Reid. We will make that part of the record now.

[The letters referred to follow:]

INDEPENDENCE MALL WEST PHILADELPHIA, PA. 19105, U.S.A. TELEPHONE (215) 592-3000
CABLE ADDRESS: ROHMHAAS TELEX 845-247 TWX 710-670-5335 TELECOPIER (215) 592-3377

ROHM
AND
HAAS
COMPANY

September 6, 1989

HAND DELIVERED

Ms. Susan Lewis
Product Manager (Number 21)
Fungicide-Herbicide Branch
Registration Division (H7505C)
U.S. Environmental Protection Agency
CM #2, 1921 Jefferson Davis Highway
Arlington, Virginia 22202

Dear Ms. Lewis:

Subject: DITHANE® Fungicides
EPA Reg. Nos. 707-78, 707-102, 707-156,
707-162, 707-179, and 707-180
DIKAR® Fungicide-Miticide
EPA Reg. No. 707-93
Application for Amended Registation
Suspension of Certain Uses

The Rohm and Haas Company voluntarily requests an amendment of our registrations to suspend use of the above-referenced products on the following food crops: apples, barley, cantaloupes, carrots, celery, corn (field, hybrid seedcorn), crabapples, cucumbers, fennel, melons, muskmelons, oats, papaya, pears, pineapples, quince, rye, squash, and watermelons. Currently registered seed treatment and turf and ornamental uses will be maintained.

The following items are attached for each of the subject products to support this request:

a. Application for Pesticide Amendment - EPA Form 8570-1.

b. Five copies of revised labeling with the suspended uses removed.

The revised labeling will be used on all new product production. In order not to disrupt grower operations that are being completed during the remainder of this growing season, product currently released for shipment or in channels of trade will not be relabeled until January 1, 1990. At that time, all remaining product not in growers' hands will be relabeled prohibiting the suspended uses. Attachment I to this letter is a listing of the product currently in our control along with an estimate of the amount that may be used by next January.

Although this amount is not large, it is important to those growers who are completing their disease control programs and who might not be able to consider alternatives. Accordingly, we request that you take this into consideration in issuing your final order approving this label change.

Should you require additional information or have any questions regarding this request, please call me at (215) 592-3058.

Sincerely,

J Ollinger

Janet Ollinger, PhD
Product Registration Manager
Agricultural Chemicals Registration
and Regulatory Affairs

JO:fs
Attachment

INDEPENDENCE MALL WEST PHILADELPHIA, PA. 19105 U.S.A. TELEPHONE (215) 592-3000
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ROHM
HAAS
COMPANY

September 15, 1989

Ms. Susan Lewis (PM-21)
Office of Pesticide Programs
U.S. Environmental Protection Agency
1921 Jefferson Davis Highway
Arlington, VA 22202

Dear Ms. Lewis:

Subject: Tolerance Petition for Reduced Tolerances Tolerances on Certain Crops and a Permanent Tolerance on Potatoes

The mancozeb registrants wish to reduce the tolerances for some mancozeb uses and establish a permanent tolerance for potatoes. The tolerance petition is enclosed. The crops involved, along with the current and proposed tolerances, are:

Crops	Tolerance Current	 Proposed
Wheat, Grain	5 ppm	1 ppm
Wheat, Bran	20 ppm	1 ppm
Grapes	7 ppm	3 ppm
Peanuts	0.5 ppm	0.1 ppm
Potatoes	0.5 ppm*	0.1 ppm
Sugarbeets	2 ppm	1 ppm

*Interim Tolerance

The mancozeb tolerances, including the interim tolerance for potatoes, have been established for some time and they are based on old residue data. New residue trials have been conducted in response to Data Call-In Notices, and the mancozeb Registration Standard, and the residue levels support the tolerance reductions shown above.

The mancozeb registrants believe that the regulatory process is strengthened by having the most appropriate tolerances. This petition is submitted on behalf of E. I. duPont de Nemours & Company, Pennwalt Corporation, and Rohm and Haas Company.

Please call me at (215) 592-3058 if you have any questions.

Sincerely,

J. Ollinger

Janet Ollinger, Ph.D.
Product Registration Manager
Agricultural Chemicals Registration
and Regulatory Affairs Department

JO:mr
Attachment

cc: Dr. Gail T. Arce
E. I. duPont de Nemours & Company, (Inc.)

Mr. Joseph R. Solga
Pennwalt Corporation

Mr. Edwin F. Tinsworth
Director
Special Review and Reregistration Division

Ms. Valerie M. Bael
Review Manager
Special Review Branch

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ROHM
HAAS
COMPANY

September 6, 1989

HAND DELIVERED

Mr. E. F. Tinsworth
Director
Special Review/Reregistration Division
U.S. Environmental Protection Agency
Crystal Mall #2
1921 Jefferson Davis Highway
Arlington, VA 22202

Subject: DITHANE® Fungicides
EPA Reg. No's. 707-78, 707-102, 707-156, 707-162, 707-179, 707-180

DIKAR® Fungicide-Miticide
EPA Reg. No. 707-93

Application for Amended Registration
Suspension of Certain Uses

Dear Mr. Tinsworth:

The Rohm and Haas Company is setting forth in this letter actions being instituted with respect to the above-referenced products which are currently undergoing Special Review. The reason for these actions is to voluntarily address hypothetical calculated risk factors through immediate and direct efforts which will reduce the use of products pending completion of the Special Review.

We agree with EPA that the best method to assess pesticide residues on fresh and processed foods is to conduct a market basket survey. At the EPA's request, Rohm and Haas and other manufacturers of EBDC products are currently undertaking such a program. We are confident that the results will clearly demonstrate that consumer exposure to these products is extremely small.

Nevertheless, the time necessary to carry out such a program is significant. In the meantime, theoretical risk calculated on the basis of the most conservative assumptions may raise questions about the continued safety of EBDC products. We believe the actions Rohm and Haas is announcing today will allow the scientific market basket study to be completed so as to give everyone confidence in the safety of these products and provide the consumer and the Agency with a real-world reduction in EBDC use pending conclusion of the Special Review.

The actions we are notifying the Agency of today are as follows:

Mr. E. F. Tinsworth
Director

I. Suspension of Registered Uses - Enclosed you will find a copy of a letter to Ms. Susan Lewis which requests an immediate voluntary amendment and label change limiting the crops on which our products can be used. This action, coupled with similar actions we understand other EBDC producers are also taking, should reduce the number of crops for which EBDC products can be used from over 84 to approximately 13. More importantly, the theoretical risk that can be calculated from the use of such products will be reduced by over 97 percent. This action eliminates any real environmental concerns while the Agency completes its Special Review.

II. Cancellation of Tolerances for Imported and Domestic Crops - For each of the crops being voluntarily suspended from our label, we will either submit a petition to cancel the corresponding tolerances or not oppose EPA action to accomplish the same result. The appropriate form for this action will be the subject of future discussions with the Agency. EPA, in consultation with other federal agencies, will, of course, have to determine the appropriate implementation date for this cancellation based on comments from U.S. and foreign producers. We believe, however, that this action directly addresses the question of crops treated in other countries, where EBDC products have been determined to be safe for use, being imported into the U.S. pending completion of the Special Review.

III. Reduction of Existing Tolerances - For those crops which are not affected by the actions noted above, we believe data are available for several crops which are sufficient to base a reduction in published tolerances without jeopardizing U.S. agricultural production. We will submit petitions to accomplish such tolerance reductions no later than September 15, 1989. In addition, as the Special Review progresses, if additional data are generated which demonstrates the ability to reduce tolerances on other crops, subsequent petitions to accomplish such actions will be submitted.

IV. Reduction in Grower Use of Products - Although the foregoing actions represent a quantifiable reduction in the use of our products, we also believe that through the use of improved programs of Integrated Pest Management, growers could use even less fungicide product to control disease. Accordingly, in conjunction with other EBDC producers, Rohm and Haas will fund research into effective strategies for incorporating fungicides into Integrated Pest Management systems (IPM). Rohm and Haas will consult with groups such as the National Academy of Sciences to identify the most appropriate groups and programs to receive such awards. At the same time, EBDC producers will be undertaking grower education programs to explain the actions set forth in this letter and assist in developing alternative pest control programs. We will, of course, keep the Agency informed of the participants and scope of this program as it develops.

V. Consumer Awareness Program - One of the reasons scientists are confident that the market basket survey will demonstrate the safety of EBDC products is because these products degrade rapidly in the field and are easily washed off fruits and vegetables either in the processing step or by the consumer. The importance of washing fruits and vegetables to remove residues from air pollution, dirt, bacteria, as well as pesticide residues is not as well understood in the U.S. as it is in other countries. For this reason, EBDC producers have agreed to fund a public awareness campaign to inform consumers concerning the importance of washing fruits and vegetables. Such a program should increase the consumer's awareness that their actions can significantly improve the quality of the food they consume.

The foregoing program dramatically reduces the theoretical risk that may be calculated today from the use of EBDC products. These actions are being taken to address consumer concerns while EPA and other agencies conduct their scientific review programs. Although we continue to believe, and other countries have confirmed, that EBDC products are safe when used as directed, we want to provide every assurance to the consumer and EPA that this is the case. Accordingly, we request that the Agency expedite consideration of the various petitions described above and take these actions into consideration in any Agency statements and publications regarding EBDCs.

Sincerely,

JF Talucci

John F. Talucci
Business Group Director
Agricultural Chemicals

JFT:mr

Dr. **Benbrook**. Fine. I would like to assert, and try to provoke you to think about this for a minute—the voluntary action by the companies on the EBDC should not have affected, really, the rate or the outcome of EPA's action on the EBDC's.

There was no new scientific information that related to the risks or the benefits of the EBDC's submitted by the companies. They merely suggested to the agency what would be an acceptable outcome of the process.

So I do not understand why it has delayed the process. The one new piece of information that I think is important that was submitted by the companies to the agency was in a letter of September 15.

One of the significant parts of the voluntary request that has not gotten any attention is that the companies did ask EPA to lower the tolerance on those uses that they sought to maintain.

In this letter, they suggest that they have data to support the lowering of the tolerances. I would just like to read a few of these to you, because it will give you some insight into the difference between the published tolerance and what the registrants feel the actual residues are likely to be.

Wheat grain: it is a very small use, less than one percent of the wheat is treated with EBDC's, but if you are a wheat farmer and you have rust in your field, and that is your year's income, it matters a lot.

The current tolerance is five parts per million. They feel it can be reduced to one. So that is a five-fold decrease.

Wheat bran: 20 parts per million to one ppm, so that is well over an order of magnitude.

Grapes, seven ppm to three; peanuts, 0.5 ppm to 0.1, on and on.

So you can see here that it is not an impossible task now to calculate the worst case risk using the tolerance levels, and risks reflecting actual residue levels.

Senator **Reid**. Why should we accept the industry's figures?

Dr. **Benbrook**. Well, I think that you will find that they have solid supporting data, derived from a field that has been treated with the pesticide under known conditions.

They probably are as good at the analytical method needed to test for their own chemicals as anyone. They are under all kinds of threats of penalties if they knowingly submit fraudulent data.

Senator **Reid**. That is how we do it with drugs. The industry submits the information, and it is approved by the Governmental agency.

Is that what you are saying here? The same principle?

Dr. **Benbrook**. I just do not think that there is any evidence that the agrichemical industry is not submitting good science. They may not be doing the right studies, or asking the right questions, but they are responding to the data requests that EPA has put before them.

Frankly, I think EPA and FDA deserve a degree of blame in not being very strategic in what they ask for. But now, there is an emerging issue that I would urge you to explore with Linda Fisher. Many of the uses that the EBDC registrants suggested should be cancelled include minor crop uses with very small acreage that do not make the companies any money, nor do they account for much risk.

The EBDC's might only be used every three years on a small part of the acreage of blueberries. There may be a quite modest risk under the worst circumstances, but it is not in the registrants economic interest to keep the use, so they cancel it.

Well, that blueberry farmer, two or three years from now, when there is a particular kind of season, might have a new disease problem, and Captan may remain the only fungicide on the market. So I really think that on all the uses of Captan, Benomyl and the EBDC's, where the three of them are registered, EPA has to ask itself, is there some reason to expect that one of these chemicals is much worse than the other two, or much better?

It does have the information in many of the cases—certainly the major crops like potatoes and tomatoes and applies—to make that judgment.

The other thing that I stress in the testimony is the phenomenon of plant diseases developing resistance to chemicals.

One of the historic advantages of the EBDC's is that—Bob can correct me if I am wrong—I am not aware of a single documented instance of resistance to the EBDC's.

Benomyl, on the other hand, because of how it works, has a rich history of resistance problems, and indeed, Benomyl just simply cannot be used to any advantage in some crops and some regions because of the emergence of strains of plant diseases where there is resistance.

So EPA has to be very cautious not to load up on one pesticide the sole challenge of controlling a disease or an insect. When that happens, there is a history of accelerating the emergence of this resistance phenomenon, and then there is a real problem.

Senator **Reid**. So I take it from what you said that you find the manufacturers' action inadequate, that the remaining risk is too high? Or are you not prepared to reach that judgement yourself?

Dr. **Benbrook**. I think it was a bold step, it was unprecedented. I would not argue with Linda Fisher's characterization of the action as historic.

But, Mr. Chairman, EPA must thoughtfully address the EBDC's, and take action that takes all these factors into account.

Senator **Reid**. I understand.

Dr. **Benbrook**. In the long run we could be doing unnecessary harm to our ability to produce food.

I am certain that there are several uses of EBDC's that can be sustained with risks well below a negligible level under any circumstances. It is one of the most affordable chemicals, and it is not acutely toxic. It does wash off.

So, it has advantages, important advantages, compared to Captan and Benomyl. Benomyl is a systemic.

Now, you asked about tomatoes, and EBDC's, and the fact that potentially the risks from processed tomato products and the EBDC's could be very high.

I would point out that 80-plus percent of the processing tomatoes are grown right around Dr. Goodman's back yard, in and around Davis, California, in Polo County, and that EBDC's are occasionally an important crop protection tool—particularly in the second crop of tomatoes grown into the fall, when the temperature drops and the air is more moist.

EBDC's might have to be applied once or twice to gain control. But they are not used on the whole acreage of tomatoes, nor are they used as heavily as in other states.

So one would expect a very infrequent pattern of finding of EBDC's in tomatoes in California in processing products. That is not a great revelation.

In Florida, on the other hand, most of the fresh market tomatoes are treated 8, 12, 15 times, with the EBDC's, on nearly all the acreage. And there is a much more serious and important concern from dietary exposure as a result of this use pattern.

If EPA has in mind controlling the risks of EBDC's, it really has to look at what is going on in Florida, where the use is heavy and the expected residues are higher.

And so, hopefully, EPA is getting sophisticated enough to know where the highest potential risks are, and it must then take whatever steps are necessary to bring them down below a negligible level.

I suspect that the EBDC's could continue to be used on fresh market Florida tomatoes, but not 15 applications a year, with a four day pre-harvest interval.

But nobody knows how far you can be cut back before the disease loss becomes excessive, and that is a challenge for the agricultural industry, and the research sector down there, to get that answer quick before the option for continued use is totally lost.

Senator LIEBERMAN. Thank you.

Thank you both. Thank you, Mr. Chairman.

Senator REID. Senator Lieberman, I appreciate your covering for me.

I apologize to Ms. Fisher and to you, Doctor. When we schedule these hearings, we do not know some of the contingencies that arise, and I am chairman of the Legislative Branch Appropriations, and we are trying to work out those problems. We have a conference scheduled Monday, and I had to work on that a little bit.

Thank you for your testimony here today, and also you, Ms. Fisher.

We look forward to working with you in the future, and we look forward to our next hearing.

This committee stands in recess.

[Whereupon, at 12:41 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record follow:]

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TESTIMONY BY JIM HIGHTOWER
TEXAS COMMISSIONER OF AGRICULTURE

BEFORE THE SENATE SUBCOMMITTEE ON TOXIC SUBSTANCES,
ENVIRONMENTAL OVERSIGHT, RESEARCH AND DEVELOPMENT
IN
WASHINGTON, D.C.
SEPTEMBER 22,1989

We generally applaud the National Academy of Sciences' recently released report, Alternative Agriculture, and we appreciate this Subcommittee's interest in the report's findings. Agricultural practices and environmental protection are increasingly linked. EPA has concluded, for example, that roughly half of our polluted run-off results from agriculture. Groundwater contamination from pesticides and fertilizers and consumer fears about pesticide residues on food are other growing concerns.

I realize that pesticide regulation is of major concern to this Subcommittee, so I'd like to mention a recent statewide Texas Poll which revealed just how concerned Texans are about widespread pesticide use. Eighty-seven percent of those surveyed considered pesticides to be a health risk. The same poll also found that most consumers -- 64 percent -- said they would be willing to pay more for organically grown produce. The Texas poll simply confirms the findings of a national survey conducted last year by the food industry which revealed that pesticide contamination was the greatest concern of U.S. food shoppers, with 75 percent listing it as their primary concern.

There is no doubt that this demand for chemical-free food led to the recent decision by three chemical manufacturers to sharply cut back their production of EBDCs, a class of fungicides widely used on vegetables. And manufacturers are not alone in responding to public concern: Grocery stores and farmers are looking for ways to produce and distribute organic and reduced-pesticide products.

These are extremely serious problems, and we are encouraged by the Subcommittee's willingness to examine them and to discuss the National Academy's exhaustive report.

The National Academy's findings are consistent with our experience in Texas: namely, that farmers are practicing alternative agriculture -- i.e., farming with fewer pesticide and fertilizer applications, with more biological controls rather than chemical controls, with more crop rotations, and with greater emphasis on soil and water conservation -- and that their operations are both productive and practical.

Some critics would insist that the alternative agriculture practices examined by the National Academy constitute a return to the days of farming with 40 acres and a mule. Don't believe them. In Texas, both low-input and organic production are profitable for small-scale operations and for mainstream farmers who are diversifying into new crops and new farming practices. Increasingly, we are finding sizeable farm operators who are converting to more cost-effective and environmentally sound production practices.

Let me tell you about a few of our success stories.

- A farmer is producing organic rice and crawfish on 167 acres near Beaumont, selling most of the rice to out-of-state suppliers and the crawfish to upscale restaurants in nearby Houston.
- A producer near San Antonio has a 1,600-acre operation on which he raises organic beef and is the state's largest single producer of organic onions and carrots.
- Out on the High Plains of Texas a producer who almost lost his farm due to low commodity prices, switched to organic production and recently sold 360 acres of blue corn to Arrowhead Mills. His farm debt has been eliminated.
- An organic peach and tomato producer southeast of Dallas has become so successful that his operation is used by the Texas A&M Extension Service to show other area farmers how alternative production methods can be implemented.

The NAS report also correctly identifies one of the major impediments to more sustainable agriculture in this country -- our current federal farm programs:

> Many federal policies discourage adoption of alternative practices and systems by economically penalizing those who adopt rotations, apply certain solid conservation systems or attempt to reduce pesticide applications.

We hope that you will work with the Senate Agriculture Committee and others involved in developing a 1990 Farm Bill and that you will insist on eliminating these existing disincentives for farmers who want to protect their soil and water and reduce their pesticide and fertilizer use.

Farmers can and will take steps, such as implementing crop rotations and biological pest control programs, to reduce groundwater contamination and polluted run-off resulting from use of agricultural chemicals _if_ they can be assured that they won't be penalized by the federal commodity programs. Making the necessary changes in our farm programs is likely to result in far greater improvements in environmental quality than new regulatory approaches -- and for much less money.

Despite this call for federal action and federal policy change, I want to emphasize that those of us working at the state and local levels are not waiting on the Congress or USDA.

TDA has established a model organic agriculture program. By next summer, at least 250 producers will be participating and complying with our state certification standards.

Of course, we're not so unrealistic as to think that every producer can switch to organic production. In many situations, some chemical use will remain necessary to produce crops. But we are committed to helping producers who want to reduce their dependency on chemicals. Texas and other states are now conducting research into integrated pest management techniques, biological controls and other less-toxic methods.

Iowa State University, for example, houses the largest sustainable agriculture research facility in the country. It is devoted exclusively to basic and applied research on sustainable agriculture systems. The center is investigating the long-term economics of sustainable agriculture as compared to conventional systems--information that is critical to farmers as they consider converting their operations. A good deal of this research is paid for by Iowa's Groundwater Protection Tax on nitrogen fertilizers and pesticides. California has created a sustainable agriculture program through the University of California at Davis.

In Minnesota, farmers and academicians are working together under the state's sustainable agriculture program, designing and implementing on-farm demonstration projects, using oil-overcharge money for funding. Kansas, Maine, Mississippi and Wisconsin all used oil-overcharge money for sustainable farming demonstration projects. Nebraska's pioneering sustainable agriculture program is operated by the state's land grant college and Extension Service.

At TDA, we have established a comprehensive Sustainable Agriculture Program. Working with producers, marketing specialists, researchers, and agricultural Extension agents, we are developing demonstration projects and workshops to show that more sustainable farming operations will protect both profits and the environment. This year, for example, TDA teamed up with Texas A&M University and non-profit organizations in Arkansas and Oklahoma to obtain $120,000 in federal LISA funds. The money is being used to help participating farmers make a transition to more sustainable vegetable production.

The release of the National Academy of Sciences' report, together with the start of deliberations on a 1990 Farm Bill, provides us with both the information and the opportunity to help create a more cost-effective and environmentally sensitive agricultural system. We at TDA have organized a working group to develop a comprehensive legislative proposal for farm program reforms. Within the next few months we will submit that proposal. I urge this Subcommittee to review the successful initiatives already under way in the states and to join with us in working to improve federal policy.

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by JIM HIGHTOWER

Burke Slaughter almost became a statistic in 1982. The Texas High Plains cotton and wheat farmer was about to become another one of the more than half million American family farmers to have quit the land in this decade and to have headed for the cities to find better paying work. But Slaughter didn't want to leave the land he'd worked for almost two decades, so he started asking around for a different way to do his business. Slaughter decided to try a method using lower chemical input -- a step towards a sustainable agriculture -- that would cut his production costs and time and, he hoped, put more money in his pocket.

Slaughter, 51, is still farming that land today. He began rotating his wheat and cotton crops, planting wheat in cotton stubble one year and cotton in wheat stubble the next. The third year the land was left fallow. As a result of adopting these and other conservation tillage techniques, Slaughter has increased his profits by 50 percent. Slaughter's methods are unusual, but by no means unique. He is one of a steadily increasing number of family farmers who have rejected the fencerow-to-fencerow, monoculture farming made prevalent by the agricultural chemical revolution. They have discovered an economic principle often abandoned by their fathers: Lower inputs -- when carefully planned -- do not mean lower profits. His success is an example of how the hard work and ingenuity of farm families combined with our abundant natural resources have resulted for centuries in a food system in this country that has been unequaled in its ability to produce and produce well.

But in another sense, Slaughter is an anomaly. In recent years, we've begun to run up an agricultural deficit. Skyrocketing production costs have outstripped farm income. Once-thriving farm families sometimes cannot put enough food on the table for their own needs. Increasing concentration in food production and processing operations is reducing the options available to consumers, raising prices and threatening food safety. Our water supplies are becoming contaminated, and our topsoil is being lost at rates comparable to those of the Dust Bowl of the 1930s. Parts of Iowa are losing two bushels of soil for every bushel of corn produced. In some parts of Texas, aquifers are being "mined"; that is, water that has been stored for centuries is being withdrawn faster than annual rainfall can replenish it.

Slaughter is one of hundreds of farmers across the Farm Belt who are responding to economic and environmental pressures to save their livelihood and their land. They are moving to low-input, sustainable farm systems that do not deplete the natural resource base, help keep alive the family farm and rural communities, produce good and good-for-you food and protect human health. Sustainable systems increase farm profits by reducing -- not necessarily eliminating -- chemical and other off-farm inputs. Through crop rotation, biological pest control, innovative tillage techniques and other methods that require more careful planning and management, they are developing a more efficient way of farming.

And the pressure to move to low-input, sustainable systems goes hand-in-hand with pressure to reform our framework for use of pesticides. Groundwater, vital to farm communities, is being contaminated by pesticides. Consumers are increasingly concerned about the health effects of pesticides on food they buy. Public health officials are issuing new warnings on the risks of exposure to pesticides for workers in agriculture, pest control and related occupations. The public is frustrated with the slow pace of the federal government's review of potential health and environmental impacts. All the while, pests are growing more resistant to our poisons.

The great decline in American family agriculture is the direct result of a system that benefits the corporate farm at the expense of the family farm; that too often stresses fencerow-to-fencerow cultivation of a single crop to the detriment of diversified agriculture; that is geared for high-volume, low-price exporters and megacorporate processors rather than for actual demand and local value-added processing; that breeds dependence on expensive synthetic chemicals rather than the replenishment of natural resources.

It is the result of a system that locks farmers into debilitating pesticide and herbicide cycles that deplete the real value of American farms. The land itself becomes addicted to chemical fertilizer, becoming less productive and losing its value. Farmers find themselves spending more in order to put more chemicals into the land while getting ever-diminishing returns.

Slaughter proves that the cycle can be broken -- and proves that it can be broken without forcing a return to 40 acres and a mule, as some critics of sustainable agriculture scream.

Sustainable agriculture requires a variety of sound agricultural practices that include crop rotation and diversification, protecting precious topsoil and giving local rural economies a stable foundation. It offers alternatives to totally chemically-dependent farming, thereby substantially reducing production costs and reclaiming the intrinsic value of the land.

At the same time, sustainable agriculture provides a safer working environment for agricultural workers and safer food for consumers, while protecting the land, water and air. Sustainable agriculture depends on the flourishing of the family farm system because family farmers have shown the greatest ability to act as proper stewards of the land. It is crucial to our food system and our way of life that our limited resources be protected so that our economic and agricultural opportunities remain limitless.

STATEMENT OF
LINDA J. FISHER, ASSISTANT ADMINISTRATOR
FOR PESTICIDES AND TOXIC SUBSTANCES
BEFORE THE
SUBCOMMITTEE ON TOXIC SUBSTANCES, ENVIRONMENTAL
OVERSIGHT, RESEARCH AND DEVELOPMENT
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

SEPTEMBER 22, 1989

Good morning, Mr. Chairman and Members of the Subcommittee. I appreciate this opportunity to testify before you about EPA's regulation of pesticides in food under FIFRA & FFDCA. As a relative newcomer to the arena of pesticide regulation, I am continually impressed with the highly complex scientific issues and the difficult public policy questions that face the Agency as we implement these laws. I am excited by these challenges and feel privileged to be a part of shaping the Agency's program to deal with them.

The recent events involving Alar served to shake the public's confidence in EPA's ability to regulate pesticides. Legitimate questions were raised about our ability to move quickly to remove troublesome pesticides from the market. This perception contributed to public concern about the safety of the food supply -- causing tremendous disruption in the apple industry. We cannot afford to let more Alar-like situations happen -- to consumers or to farmers -- and I believe an effective EPA program is a large part of the answer.

I want to take this opportunity today to discuss with you our efforts to improve and strengthen our management of the program.

In many ways, they mirror the recommendations of your report. As we make improvements in the pesticide program, it will be most important for us to continue working together. I welcome your partnership.

I want to focus today on the new direction of the pesticide program. In doing so, I will discuss some of the points raised in the Subcommittee's report on Government Regulation of Pesticides in Food. Once we have had a chance to review it thoroughly I would like the opportunity to provide our detailed response to the report's recommendations in writing.

REREGISTRATION AND TOLERANCE REASSESSMENT

One of the biggest challenges facing EPA is to strengthen public confidence in the pesticide regulatory program. The speedy review of existing pesticides is central to meeting that challenge. Although originally referred to as "FIFRA Lite," the 1988 amendments have had a profound impact on how we go about the business of regulating pesticides. For example, EPA will shortly be cancelling the registrations of over 13,000 products for failure to pay the modest 1988 maintenance fees. While many of these products were not in commercial production, we think this "house cleaning" is just the beginning of the sweeping changes that will flow from the 1988 amendments.

The most important effect of these amendments will be to accelerate greatly the pace of reregistration. The registrants are given a tough schedule by which to submit new scientific studies supporting their existing pesticide products. EPA is given equally tough deadlines for review of these data. Attached to my written testimony are charts depicting the FIFRA '88 reregistration schedule.

Priorities for Reregistration

As your Subcommittee report points out, there are practical limits on how quickly studies can be performed, data reviewed, and decisions made. I agree with your report that the Agency must set its priorities to look at those pesticides posing the greatest risks as expeditiously as possible. We are doing exactly that. The Agency's priorities have been, and continue to be, consistent with the recommendation of the National Academy of Sciences report on the "Delaney Paradox" to focus on risk. Food use chemicals have the highest priority for reregistration. Since FIFRA '88 did not establish a schedule for the majority of these chemicals (List A chemicals), as it did for the other old pesticides, EPA is developing such a schedule, which will be available soon. List A comprises between 80 or 90% of the total volume of pesticides used in agriculture in this country. Within List A, we will give the highest priority to those chemicals which appear to pose the greatest risk.

The National Academy of Sciences report cited 10 chemicals to which they attributed a significant portion of dietary risk. As the NAS report acknowledged, the risk ranking of pesticides in their study used assumptions which tended to overstate the actual risks. Nevertheless, of these 10 pesticides identified by NAS as potentially presenting the greatest risk, 3 (zineb, chlordimeform, and captafol) have been voluntarily cancelled, and 1 (folpet) no longer has any food uses. Three (captan, linuron, and chlorothalonil) have been found to pose no greater than a negligible risk, following the imposition of additional restrictions. Maneb and mancozeb (along with 3 other EBDCs) are in Special Review, and the last, permethrin, is subject to priority review as soon as additional risk assessment data are received.

Tolerance Reassessment

An integral part of reregistration is the reassessment of tolerances. We will be looking at the scientific data on a pesticide, not only to determine what changes to make in how the pesticide is used, but also whether to modify the tolerances for the chemical. Once we have completed the scientific analyses, it is necessary to translate our conclusions into regulatory action. As we go through the reregistration process, we intend to propose tolerance actions for each chemical at the same time that we undertake reregistration actions.

The Subcommittee's report recommends that tolerances should be based on safety. I couldn't agree more -- public safety is the driving force behind tolerance setting. However, because of complexity of the risk assessment and tolerance setting process, we find that many people are confused by the distinction between the tolerance level, which is primarily an enforcement tool, and the anticipated residue levels used to assess risks. We set the tolerance level based on the maximum level of residues that might result if the farmer applies the pesticide at the maximum legal application rate, under the climate conditions which would cause the highest residue level, and at the latest allowed application date prior to harvest -- in other words, under the combination of conditions likely to produce the highest level of residues. For enforcement purposes, the tolerance must be set at the maximum level one might find from use according to label directions; otherwise, users could not safely trust the label directions, and label directions would no longer make sense. However, pesticide use almost never occurs under the foregoing worst case conditions. Therefore, when there are concerns about dietary risk, the most accurate estimates of dietary exposure are based on data showing the residues the consumer is actually likely to consume. Those residue levels are determined by sampling the actual commodities intended for people to eat. We normally get such data, either from farm gate monitoring or in market-basket surveys. Data on actual pesticide usage are also helpful in estimating potential exposures.

Management Initiatives

Because of the increased work load associated with FIFRA '88, the Agency has begun to expand the reregistration program. Our first steps were to expand the staff and to build the infrastructure to support the next 9 years of reregistration. We now have approximately 660 people, compared to only 565 a year ago.

We are developing more advanced information systems to handle the anticipated flood of incoming data and for the longer term, we are evaluating the use of state-of-the-art ADP systems to improve our ability to provide current information on the status of any given registration or application. Using these new systems, we plan to begin issuing status reports on our progress in reregistration in the near future.

POLLUTION PREVENTION AND PUBLIC PERCEPTION

As you know, Bill Reilly is committed to pollution prevention. In the area of pesticide use, that translates into reducing the amounts of pesticides released into the environment. While I believe it is possible to reduce overall usage, I do not agree with those members of the public who seek drastic cuts in use at any cost.

I believe the quality of public debate about pesticides and food safety would benefit considerably if it were more widely understood that EPA must consider both the risks and the benefits of a pesticide in reaching its regulatory decisions on pesticide use. While the Alar controversy has focused on risks, let us not lose sight of the fact that pesticide use also provides society with significant benefits, for example controlling microbes that spread disease or killing weeds and insects that threaten crops.

Pollution Prevention

In my view, we need to preserve the beneficial uses of pesticides, while, at the same time protecting public health and the environment by eliminating unreasonable risks posed by pesticides. Therefore, I believe we should continue to encourage the development and use of programs such as Integrated Pest Management (IPM) and Low Input Sustainable Agriculture (LISA). In addition, I want to look at the broader relationship between agricultural policies and environmental concerns. In particular, I am interested in examining and adjusting the incentives that encourage unnecessary use of pesticides. I expect to be working closely along these lines with our sister agencies, USDA and FDA. In this and in other areas we are looking toward more interagency cooperation in the coming months and years.

Public Perception

In pursuing these goals, I am committed to open decision-making; we need to do a better job of explaining how we make decisions and of explaining risks to consumers. We need to de-mystify what the government does in regulating pesticides. It should be better appreciated that risk assessment is not an exact science. Projections based on animal studies are not absolute predictions of actual cases of human disease but upperbound estimates of potential adverse impacts. Moreover, the government uses this tool in a very protective manner. We are likely to overestimate risks because the assumptions used are intended to err on the side of safety in order to ensure public health protection. Our regulatory system and the science which supports it change over time to more fully look for potential adverse effects. Decisions on pesticides that made sense 10 or 20 years ago may not hold up in light of new science and better research methods. As we apply new scientific standards to old chemicals, we are likely to identify concerns about some that were unrecognized in the past.

An informed public can better understand and participate in the regulatory process. When confronted by health and safety concerns, the American public deserves a better set of options than indifference or panic. In my view, that means it is worth a substantial effort to let people know what we do and how we do it. We need to do this because informing the public accurately and truthfully about risks is in itself an essential part of protecting the public interest, and leads to improved decision-making.

As we saw in the Alar case, society pays a price when an issue like this is packaged in terms of fear and distrust. This can lead to unfortunate economic dislocations, as the public fear and avoidance of apple products illustrates. More importantly, perhaps, there is a loss of confidence in the government and its ability to protect the American food supply -- confidence which is difficult to restore. Finally in such an atmosphere it is exceedingly difficult to have any constructive discussion and to develop new approaches to these difficult issues. Thus, I intend to give high priority to raising the quality of public dialogue on food safety issues in the future.

BETTER SCIENCE - BETTER DECISIONS

As I said in my confirmation statement, good science is the foundation of good decision-making. The Agency has on-going a number of initiatives to improve the quality of its scientific analyses. I would like to address two of these initiatives and then comment on our approach to inert ingredients, as well as on the role of the Scientific Advisory Panel (SAP) in assuring that EPA's pesticide decisions are based on high quality science.

Dietary Risks to Children

We know that the diets of children may differ substantially from those of adults, and therefore they may experience different risks. The Agency has done a remarkable job in creating the Tolerance Assessment System (TAS). This advanced computerized data base allows EPA to refine the exposure estimates of pesticides in the diets of infants, children, pregnant women, and other subgroups. We routinely consider the potential for higher dietary exposures for different subgroups, and we will continue to do so. As recommended in a recent General Accounting Office report on our Tolerance Assessment System, we are preparing a policy statement describing how we will consider subgroup exposures in our risk assessments. Additionally, our registration and cancellation decisions will articulate our assessment of any risks posed to sensitive subgroups of concern. TAS makes such information readily available.

In assessing potential dietary exposure to a pesticide, EPA uses the most accurate data available to indicate what levels of residue can be anticipated in the diet. Not only must we consider what residue levels will remain on food, but we must also take into account how much of different types of food people will eat. The USDA Nationwide Food Consumption Survey is the Agency's primary source of data on people's eating habits. Unfortunately, the most recent comprehensive USDA survey available to EPA dates back to 1977-78. EPA is awaiting the 1987-88 survey results. We expect this data to be available to us after January 1990. Because those data are recorded in terms of such items as pizzas, chocolate cake, etc., a significant amount of recipe conversion is necessary to make the information useful to EPA, and thus, it will probably take at least 6 months after we receive the data before they are fully incorporated into our Tolerance Assessment System.

But reflecting varying dietary patterns of different subgroups may not be enough. We need to know more about possible differences in the metabolism of pesticides by children or in what way they may be more or less sensitive to certain chemical effects. Because of this concern, last year the Agency asked the National Academy of Sciences to conduct a study of scientific and regulatory issues concerning pesticides in the diets of infants and children, including the issue of how to assess risks and establish tolerances that will protect them. The study, which is expected to be complete in the fall of 1990, is likely to provide important information which will provide a foundation for improving EPA's ability to evaluate and estimate risk, and may well lead to different ways of making decisions on pesticides. Thus, when the

NAS study becomes available, the Agency will revise or expand, as necessary, our policy statement on addressing subgroups in our risk assessment process.

Neurotoxicity Testing

The Subcommittee report also recommends that EPA expand its testing requirements to include additional studies on the potential for pesticides to cause neurotoxic effects. We agree and are planning to propose such changes to our data requirement regulations.

The evaluation of potential neurotoxicity is often a critical element for a thorough hazard assessment of pesticides. Examples of neurotoxic effects are behavioral and functional disorders, such as those attributed to lead exposure. Traditionally, EPA has required testing for neurotoxicity for certain classes of pesticides. In recent years, our knowledge about this effect has expanded significantly. As a result, we believe that there are new and better ways to test pesticides for effects on the nervous system. In 1987, EPA presented to the SAP its proposal for an expanded and updated set of testing guidelines for the evaluation of potential neurotoxicity in the adult organism. Following review and comment by the SAP and other scientific experts, EPA made appropriate modifications. The updated set of guidelines will be presented to the Panel again next week.

In addition, the Agency recently drafted a set of testing guidelines for the evaluation of developmental neurotoxicity.

These guidelines focus upon testing for neurotoxic effects that may arise in offspring from exposure of their mothers during pregnancy or from direct exposure during the period from infancy to adulthood.

Until the testing guidelines are finalized and adopted by the Agency, decisions on when to apply testing requirements will be made on a case-by-case basis.

Inert Ingredients

Inert ingredients in pesticides pose their own problems. We all agree that we need to pay more attention to inerts than has been the case in the past. Up until the last couple of years, EPA has focused on active ingredients, and inert ingredients have had little attention. While the general consensus is that active ingredients, as a class, are more hazardous than are inert ingredients, as a class, some pesticidally inert chemicals are toxic in their own right. The Agency's Inert Strategy, adopted in April 1987, is intended to address those inert ingredients of pesticides which may pose risks.

The strategy starts by listing each inert ingredient in one of four lists, List 1 -- inert ingredients of concern; List 2 -- inert ingredients which have not been tested for toxicity but which are similar in chemical structure to compounds with demonstrated toxic effects; List 3 -- inert ingredients on which we have very little or no toxicity data; and List 4 -- inert ingredients which are believed to be essentially innocuous. The Agency has concentrated first on List 1, those chemicals known to be toxic. For List 1 inerts, EPA has required any company whose products contain one or more of these compounds to submit a battery of toxicity studies or to reformulate their products to remove the ingredient(s). Companies have chosen to reformulate over 500 of the products, and to cancel 174 more. Additional registrations have been suspended, while only a few companies have committed to provide the required data. In short, our initiative here has led to a shift away from reliance on these toxic compounds. EPA, however, recognizes the need to address the remaining inerts and is formulating a plan to collect the data necessary to allow us to make sound regulatory decisions concerning the use of these chemicals in pesticide products.

The Role of the FIFRA Scientific Advisory Panel (SAP)

Once EPA has the necessary data and the Agency's scientists have reviewed it and reached conclusions about what they mean for regulatory purposes, it is essential that we have thoughtful, unbiased input from experts in the various scientific disciplines from outside EPA. It is for this purpose that FIFRA provides for the FIFRA Scientific Advisory Panel (SAP).

The SAP is a panel of independent scientists, recognized in their respective fields, who serve as peer reviewers for EPA. They review the scientific basis of significant regulatory decisions and provide comments as to the impact on health and the environment of those regulations. The Agency not only relies on the advice of the

Panel for regulations affecting specific chemicals as required by FIFRA, but also invites the comments of the SAP on guidelines for testing, exposure models, scientific issues relating to risk assessment, and for peer review of major scientific studies. The process of peer review by the SAP plays a vital role in the overall regulatory review of pesticides, and I am strongly committed to ensuring the viability of the Panel.

I firmly believe that it is possible to maintain a Panel with high scientific standards which is also held to high ethical standards. It is important that the American public have confidence in both the technical competence and objectivity of the scientists who make the important scientific decisions about the hazards of pesticides.

During my confirmation hearing, I promised to work with our Office of General Counsel to review the financial disclosure requirements for SAP members to see whether they should be strengthened. That work is actively underway. We are jointly developing some improvements to our process. I hope we will be far enough along in our work that by next week when the SAP meets, I will be able to discuss our new proposals with them.

In addition to questions about possible conflicts of interest, the Subcommittee report expresses concern about the diversity of Panel members' scientific backgrounds and views. Specifically, you have expressed interest in getting persons with training in pediatrics and public health on the Panel. In my August 3 letter to Senator Lieberman, I stated that I will place a new emphasis on the search for pediatricians and public health experts to be included in the deliberations of the Panel on relevant issues, and also to be considered for membership. I have just sent a letter to the National Institutes of Health and the National Science Foundation advising them that as positions on the Panel open up, I will be seeking pediatricians and public health officials who have the necessary credentials. In addition to the requisite professional training, I will also encourage the recruitment of candidates that represent a broad spectrum of viewpoints.

LEGISLATIVE NEEDS

Although FIFRA '88 made a significant contribution to the Agency's ability to accelerate its review of old chemicals, more needs to be done. The decision-making process under FIFRA is labor intensive and unnecessarily time consuming. It has contributed to the perception that the Agency's hands are tied when it comes to removing troublesome chemicals from the market.

I read with interest the Subcommittee's endorsement of the various initiatives for streamlining the FIFRA administrative process, changing the standard for imminent hazard used for suspension of pesticides, and other improvements. It is clear to me that, as the data begin to flow in from the requirements of FIFRA '88, we will know more and more about the old pesticides. Some of this information will indicate problems with the old chemicals, and the Agency will need to take action. It is essential that we amend FIFRA to enable the Agency to move quickly to remove these from the market. Such legislative changes are necessary if we are to maintain the public's confidence in the government's ability to guarantee a safe food supply.

The Agency is actively working within the Executive Branch to develop these concepts into a set of legislative proposals for the President. Whether this will take the form of legislation has yet to be decided.

CONCLUSION

In closing Mr. Chairman, I can assure you I am all too aware of the problems, both real and perceived, that I face as I begin my tenure as the Assistant Administrator for this most important program.

I accepted the job because I wanted to be a part of dramatic change in a program that is on the cutting edge of environmental and agricultural policy -- change forced by FIFRA '88, fostered by public concern and involvement, and encouraged by leadership at EPA that is committed to moving this program forward.

I take great pride in having some of the Agency's best professionals to assist me in meeting these challenges, and I look forward to working with members of this Subcommittee as we move ahead in the coming months.

ATTACHMENT 1

Pesticide Registration Process

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
EPA	REGISTRANT	REGISTRANT	EPA	EPA
Issue Lists	Respond	Summarize and Reformat	Review Submissions (2 & 3)	Review All Data
	Identify Data Gaps	Certify Raw Data	Identify Data Gaps	Reregister or Take Other Action
	Agree to Fill Gaps	"Flag" Adverse Data	Publish Data Gaps	
	Pay Fee	Pay Fee	Issue DCI	

EPA

Guidance
12/24/89

List A:	3/24/89	N/A Fees 8/89	N/A	2nd Round Review
List B:	4/24/89	8/25/89	5/25/90	11/25/90
List C:	7/24/89	10/24/89	7/24/90	7/24/91
List D:	10/24/89	1/24/90	10/24/90	7/24/92

AFTER ALL DATA IN
(FOR ALL LISTS)

1 Year for Review of Data

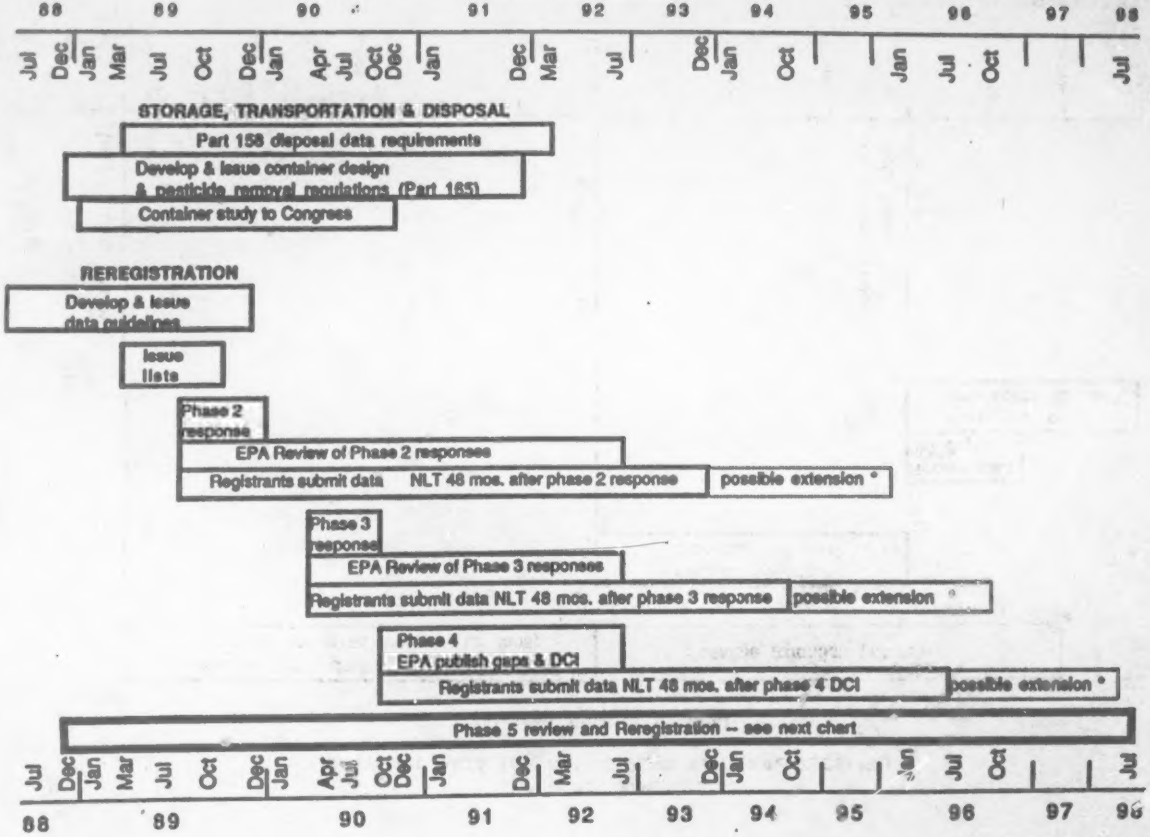
Product Specific Data Due 8 Months Later

Review of Prod. Spec. Data in 90 Days

Reregister Product 6 Months Later

ATTACHMENT 2

FIFRA 88 TIMELINE

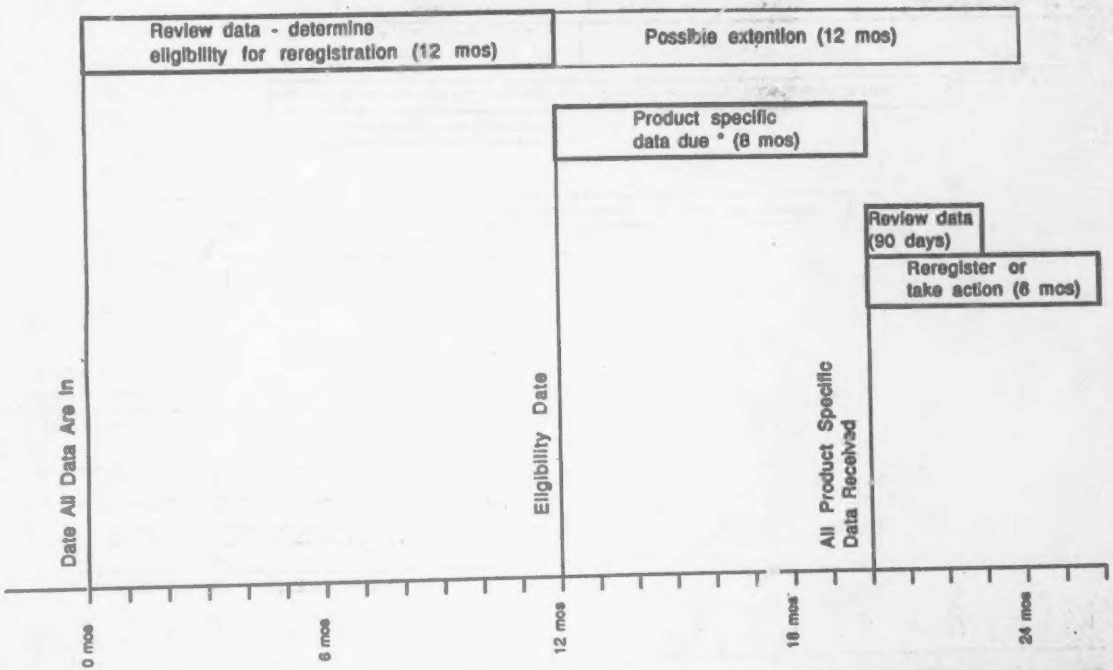


*extensions will be granted only in extraordinary circumstances

ATTACHMENT 3

EPA PHASE 5 REVIEW
AFTER ALL DATA FOR ACTIVE INGREDIENT ARE RECEIVED

[elapsed time in months]



* Product specific data must be submitted 8 months after the determination of eligibility for reregistration unless EPA determines a longer period is necessary.

Alternatives to Pesticides: Findings and Recommendations from the NAS Report Alternative Agriculture

Invited Testimony

by

Dr. Robert M. Goodman[1]
Dr. Charles M. Benbrook[1]

Mr. Chairman, thank you for the invitation to testify this morning on this complex and difficult subject. In May, 1987, the Board on Agriculture released an important report, Regulating Pesticide in Food: The Delaney Paradox. Our 1987 report highlighted problems in the current statutory and regulatory scheme governing pesticide regulation. Its basic recommendations were that:

* A negligible risk standard should be adhered to consistently in setting or adjusting tolerances for new and old pesticides.

* The standard should be applied to the combined residues of a given pesticide on all fresh and processed foods derived from a given crop.

* When several pesticides registered for use on a given crop are known to pose risks above a negligible level, EPA should develop crop-wide risk-benefit assessments, both before and after potential regulatory actions, and on this basis move forward with actions--possibly affecting several pesticides simultaneously--that appear most promising, and justified, in terms of reducing public health risks below a negligible level.

* So-called "bad actor" pesticides should be acted upon as a first order of priority.

Over two years have passed since the release of the 1987 NAS report. Some modest progress has been made by the Agency in response to the report's recommendations. Several thoughtful legislative proposals have surfaced which attempt to resolve the underlying statutory incongruities which give rise to the Delaney Paradox. Given the current climate in the

---

[1] Dr. Robert Goodman, Vice President for Research and Development at Calgene, Inc., Davis, California, is a member of the committee which authored the report Alternative Agriculture, and a member of the NRC Board on Agriculture. Dr. Charles Benbrook is Executive Director of the Board on Agriculture, National Research Council/National Academy of Sciences.

Congress, and the apparently wide range of views that persist within the Administration regarding what the key legislative issues are, it is hard to imagine speedy passage of corrective legislation. There is also little reason to expect that EPA will be able to markedly increase the pace of administrative actions, as long as the underlying statutory and procedural problems embedded within the core provisions of the FIFRA and FDCA statutes remain unaltered and unreconciled. The consequences of this stalemate include loss of consumer confidence in the safety of the food supply, unwarranted and unpredictable losses to producers and the food industry, lessened private sector investment in innovative pest control alternatives, complications in dealing with food safety in the context of GATT and in competing for key export markets, and a perhaps misguided skewing of regulatory agency science and fiscal priorities.

On September 7, the NAS released another important report entitled Alternative Agriculture. Our new report presents a comprehensive assessment of the challenges confronting American agriculture. We attach excerpts from the report showing the committee membership and breadth of the report's scope. The report addresses a wide range of issues, including crop and animal production costs, economic performance, resource conservation, animal care, food safety, research and regulatory policy, and the impacts of government farm programs and policies. Recommendations are offered in several areas. As requested in your letter of invitation, we focus this morning on findings and recommendations related to alternatives to pesticides, and government policies impacting farmers' selection of pest control systems and technologies.

Four conclusions warrant attention this morning:

> "Well-managed alternative farming systems nearly always use less synthetic chemical pesticides, fertilizers, and antibiotics per unit of production than comparable conventional farms. Reduced use of these inputs lowers production costs and lessens agriculture's potential for adverse environmental and health effects without necessarily decreasing--and in some cases increasing--per acre crop yields and the productivity of livestock management systems."
>
> "Alternative farming practices typically require more information, trained labor, time, and management skills per unit of production than conventional farming."
>
> "Federal grading standards, or standards adopted under federal marketing order, often discourage

> alternative pest control practices for fruits and vegetables by imposing cosmetic and insect-part criteria that have little if any relation to nutritional quality."
>
> "Current federal pesticide regulatory policy applies a stricter standard to new pesticides and pest control technologies than to currently used older pesticides approved before 1972. This policy exists in spite of the fact that a small number of currently used pesticides appears to present the vast majority of health and environmental risks associated with pesticides. This policy inhibits the marketing of biologically based or genetically engineered products and safer pesticides that may enhance opportunities for alternative agricultural production systems."

Based on these conclusions and the committee's extensive assessment of the scientific literature and emerging technologies, two recommendations for change in regulatory policy are offered:

> "A set of guidelines for assessing the benefits of pesticides under regulatory review should be developed. This procedure must include a definition of beneficiaries as well as an assessment of the costs and benefits of other available pest control alternatives. Benefits of control methods must be assessed as they accrue to growers, consumers, taxpayers, the public health, and the environment. As a basic rule, the benefits of any pest control method should be characterized as the difference between its benefits and those of the next best alternative, which may involve an alternative cropping system that requires little or no pesticide use. The dollar costs of the health and environmental consequences of each pest control method should be weighed against its benefits."
>
> "Public information efforts should explain to consumers the relationship of appearance to food quality and safety. Alternate means of controlling the supply and price of fruits and vegetables should be developed. Cosmetic and grading standards should be revised to emphasize the safety of food and deemphasize appearance and other secondary criteria."

Our new report contains detailed assessments of the current status of IPM systems (pages 175-188); the economic consequences of adoption of IPM, (pages 208-214); the economics of biological control (pages 219-224); the prospects for genetic engineering and other biotechnologies to advance less chemical-intensive and animal drug intensive production systems. A few key points warrant emphasis this morning:

* In general, farmers have the broadest array of chemical and non-chemical control options to address weed problems; a moderate array of options is available, in most cases, to control insects; and, limited non-chemical control options exist for many important plant diseases. The limited choice of non-chemical alternatives is of great concern because of the difficult choice farmers must make among registered fungicides, most of which are both costly and of toxicological concern.

* In terms of balancing risks and benefits, EPA's most difficult analytical task--and the challenge very much on this committee's mind-involves the major registered fungicides used in some regions on about two dozen important fruit and vegetable crops.

* The reliance on pesticides varies greatly across the country, and by cropping patterns. In general, IPM and biocontrol alternatives are more effective in dry, hot climates than in humid, wet regions. Hence, the benefits to a given pesticide registered for use on a given crop may be very high in one production region, but very low--or irrelevant--in another. Indeed, the local economic, environmental, and food safety consequences of pesticide use are remarkably variable. This has major implications as the Congress considers imposing new national regulatory standards and procedures.

* The problem of pesticide resistance is rapidly growing more pervasive and troubling. (See pages 123-126.) It is vital that EPA take the potential for resistance into account when assessing the impact of regulatory actions. In the case of fungicides, strict regulatory actions on the EBDC's, for example, will increase benomyl use on some crops. Sole reliance on benomyl, however, could accelerate the emergence of benomyl-resistant plant diseases, forcing farmers to make more frequent, heavy pesticide applications. The net result

may be an increase in risk and increase in pest control costs.

- The tools of biotechnology are revolutionizing the ability of scientists to understand the biology and ecology of plant-pest interactions. Many exciting new pest control technologies are moving closer to widespread commercial applications (see case studies six and eight for two examples), yet for many crops in many regions, a great deal of both basic and applied field research must be undertaken to devise resilient, effective, and affordable genetic and biological control options. In the meantime, most of us will choose to keep eating, and prudent use of pesticides will help make our culinary experiences more satisfying nutritious, and affordable.

In your letter of invitation Mr. Chairman, you asked about plant disease control alternatives. Case study number 7 (pages 336-349) focuses on four large fresh-market vegetable farms in south Florida. All four farms have employed the services of Glades Crop Care, Inc., the largest private pest scouting service in south Florida, and have substantially reduced insecticide use through a variety of IPM techniques. The case study states:

> "Regarding the direct costs of a pest control program with and without the IPM scouting, H.C. Mellinger reported that, for a fresh-market tomato crop, an average routine pesticide program applied preventatively every 2 to 5 days (without scouting) will cost the grower between $450.00 and $700.00 per crop acre for control products alone. Using IPM, a grower's direct pest control costs range from $200.00 to $300.00 per crop acre for average insect stress years. Much of this cost reduction results from the proper timing of insecticide use, which often eliminates the need for repeat applications; reduced rates of use because insecticide is applied to the early instars and stages; and the application of products only when necessary, that is, for those insects present at economic threshold levels. Another major benefit of IPM is reduced stress on the environment. Finally, there are the other benefits of reduced pesticide use, including less exposure for workers, less

> demand for and wear of spray rigs, fewer pesticide containers to dispose of, and fewer supervisory hours."

The case study does not assess in great detail plant disease control alternatives. The degree of reliance of mancozeb, an EBDC fungicide, in the production of sweet corn is contrasted before and after adoption of IPM (see Tables 3 and 4 attached). Using conventional methods of disease control, farmers were typically applying one pound of mancozeb per acre 11 times, with the last application about two weeks prior to harvest. Using IPM, growers were able to achieve adequate control with just two applications, the second occurring nearly 5 weeks prior to harvest. The consequences of this reduction on residue levels will be very significant, although data on actual pesticide residue levels following adoption of IPM has not been routinely developed, nor taken into account by EPA in shaping regulatory actions or policies. As noted earlier, our report recommends that IPM and non-chemical control alternatives should be more systematically assessed and taken into account.

Thank you for the opportunity to present this testimony this morning.

ALTERNATIVE AGRICULTURE

Committee on the Role of
Alternative Farming Methods
in Modern Production Agriculture

Board on Agriculture

National Research Council

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Contents

PART ONE

EXECUTIVE SUMMARY 3
- Findings, 5
- Conclusions, 8
- Recommendations, 17
- The Future of Alternative Farming, 23

1 AGRICULTURE AND THE ECONOMY 25
- Trade, 27
- Agricultural Industries, 32
- The Structure of Agriculture, 54
- Regional Distinctions, 57
- The Power of Policy, 65
- Summary, 85

2 PROBLEMS IN U.S. AGRICULTURE 89
- The Farm Economy, 90
- Trade, 93
- Natural Resources, 97
- Summary, 130

3 RESEARCH AND SCIENCE 135
- Crop Rotation, 138
- Plant Nutrients, 141
- Livestock, 164
- Pest Control in Crops, 175
- Summary, 188

4 ECONOMIC EVALUATION OF ALTERNATIVE FARMING SYSTEMS 195
  Economic Assessments of Alternative Methods, 196
  Alternative Pest Management Strategies, 208
  Alternative Animal Disease Prevention Strategies, 224
  Studies of Diversification Strategies, 228
  Impact of Government Policy, 235
  Summary, 241

PART TWO

THE CASE STUDIES 247

1 Crop and Livestock Farming in Ohio: The Spray Brothers ... 253

2 A Mixed Crop and Livestock Farm in Southwest Iowa: The BreDahl Farm 266

3 A Diversified Crop and Livestock Farm in Virginia: The Sabot Hill Farm 275

4 A Mixed Crop and Livestock Farm in Pennsylvania: The Kutztown Farm 286

5 Crop-Livestock Farming in Iowa: The Thompson Farm 308

6 Tree Fruits, Walnuts, and Vegetables in California: The Ferrari Farm 324

7 Florida Fresh-Market Vegetable Production: Integrated Pest Management 336

8 Fresh Grapes in California and Arizona: Stephen Pavich & Sons 350

9 Integrated Pest Management in Processing Tomatoes in California: The Kitamura Farm 374

10 Livestock Farming in Colorado: Coleman Natural Beef 388

11 Rice Production in California: The Lundberg Family Farms 398

GLOSSARY 419

INDEX 427

TABLE 3 Per Acre Pesticide Application for Fall Sweet Corn Under IPM in the Everglades Agricultural Area, 1980

	Pesticide				
Date	Methomyl (Insecticide)	Toxaphene[a] (Insecticide)	Mancozeb (Fungicide)	Manganese (Fertilizer)	Cost/Active Ingredient
9/30	1 pint	1 pint	1 pound	1 pound	$ 6.40
10/6	1 pint	1 pint		1 pound	4.31
10/11	1 pint	1 pint			4.31
10/14	1 pint	1 pint			4.31
10/17	1 pint	1 pint	1 pound	1 pound	6.40
11/1	1 pint				3.25
11/2	1 pint				3.25
11/3	1 pint				3.25
11/5	1 pint				3.25
11/7	1 pint				3.25
11/9	1 pint				3.25
11/11	1 pint				3.25
11/14	1 pint				3.25
11/17	1 pint				3.25
11/19	1 pint				3.25
			Costs		
Insecticide, fungicide, and manganese	$48.75	$5.30	$3.80	$0.38	$ 58.23
Application (15 applications at $2.00 each)					30.00
Herbicide (2 pounds atrazine + 1 quart 11-E oil postemergence)					4.44
Scouting					7.50
Total					$100.17

[a] The Environmental Protection Agency has cancelled toxaphene for all agricultural uses except as a livestock dip for parasites.

SOURCE: K. Shuler, Extension Service, U.S. Department of Agriculture, Palm Beach County, Florida, correspondence, 1986.

TABLE 4 Typical Per Acre Pesticide Application for Fall Sweet Corn Not Using IPM in the Everglades Agricultural Area, 1980

	Pesticide				
Date	Methomyl (Insecticide)	Toxaphene[a] (Insecticide)	Mancozeb (Fungicide)	Manganese (Fertilizer)	Cost/Active Ingredient
9/30		1 quart			$ 2.13
10/2	¼ pound	1 pint	1 pound		6.26
10/5	¼ pound		1 pound		5.20
10/7	¼ pound		1 pound	1 pound	5.34
10/11	¼ pound		1 pound	1 pound	5.34
10/14	¼ pound		1 pound		5.20
10/17	¼ pound		1 pound	1 pound	5.34
10/20	¼ pound		1 pound	1 pound	5.34
10/24	¼ pound		1 pound	1 pound	5.34
10/27	¼ pound		1 pound		5.20
10/30	¼ pound				3.25
11/2	¼ pound				3.25
11/5	¼ pound		1 pound		5.20
11/7	¼ pound				3.25
11/9	¼ pound				3.25
11/12	¼ pound		1 pound		5.20
11/14	¼ pound				3.25
11/16	¼ pound				3.25
11/18	¼ pound				3.25
11/20	¼ pound				3.25
11/22	¼ pound				3.25
11/25	¼ pound				3.25
11/27	¼ pound				3.25
			Costs		
Insecticide, fungicide, and manganese	$71.50	$3.19	$21.45	$0.70	$ 96.84
Application (23 applications at $2.00 each)					46.00
Herbicide (1½ pounds atrazine postemergence)					2.48
Total					$145.32

[a] The Environmental Protection Agency has cancelled toxaphene for all agricultural uses except as a livestock dip for parasites.

SOURCE: K.Shuler, Extension Service, U.S. Department of Agriculture, Palm Beach County, Florida, correspondence, 1986.